Red Line/Blue Line Connector

Expanded Environmental Notification Form

September 2007

Submitted by

Massachusetts Executive Office of Transportation

Prepared by

TranSystems

Commonwealth of Massachusetts
Executive Office of Environmental Affairs ■ MEPA Office

ENF Environmental Notification Form

For Office Use Only *Executive Office of Environmental Affairs*
EOEA No.: MEPA Analyst: Phone: 617-626-

The information requested on this form must be completed to begin MEPA Review in accordance with the provisions of the Massachusetts Environmental Policy Act, 301 CMR 11.00.

Project Name: **Red Line/Blue Line Connector**		
Street: **Cambridge Street**		
Municipality: **Boston**	Watershed: **Boston Harbor**	
Universal Tranverse Mercator Coordinates: **(See Attachment 3 for location)**	Latitude: **(See Attachment 3 for location)** Longitude:	
Estimated commencement date: **2013**	Estimated completion date: **2017**	
Approximate cost: **$242 - $302 million**	Status of project design: **0** **%complete**	
Proponent: **Executive Office of Transportation (EOT)**		
Street: **10 Park Plaza Suite 4150**		
Municipality: **Boston**	State: **MA**	Zip Code: **02116**
Name of Contact Person From Whom Copies of this ENF May Be Obtained: **Stephen Woelfel**		
Firm/Agency: **EOT Office of Transportation Planning**	Street: **10 Park Plaza Suite 4150**	
Municipality: **Boston**	State: **MA**	Zip Code: **02116**
Phone: **617-973-7474**	Fax: **617-973-8035**	E-mail: steve.woelfel@eot.state.ma.us

Does this project meet or exceed a mandatory EIR threshold (see 301 CMR 11.03)?
☒Yes ☐No

Has this project been filed with MEPA before?
☐Yes (EOEA No._____) ☒No

Has any project on this site been filed with MEPA before?
☐Yes (EOEA No._____) ☒No

Is this an Expanded ENF (see 301 CMR 11.05(7)) requesting:

a Single EIR? (see 301 CMR 11.06(8))	☒Yes	☐No
a Special Review Procedure? (see 301CMR 11.09)	☐Yes	☒No
a Waiver of mandatory EIR? (see 301 CMR 11.11)	☐Yes	☒No
a Phase I Waiver? (see 301 CMR 11.11)	☐Yes	☒No

Identify any financial assistance or land transfer from an agency of the Commonwealth, including the agency name and the amount of funding or land area (in acres):

Any state financial assistance will be further defined in the EIR. Funding is expected to come from state and local funds. All land to be used by the project is public right-of-way owned by the City of Boston or the Department of Conservation and Recreation (DCR), some of which may be subject to Article 97. There are no land transfers expected from any agencies of the Commonwealth.

Are you requesting coordinated review with any other federal, state, regional, or local agency?
☐Yes(Specify) ☒No

List Local or Federal Permits and Approvals:

While the Executive Office of Transportation is the project proponent, the MBTA will own and operate the project. As an entity of the Commonwealth of Massachusetts, the MBTA is generally exempt from the requirements of municipal permitting programs.

The federal and state permits and approvals anticipated to be required are listed below:

National Pollution Discharge Elimination System General Permit, Section 402, Federal Clean Water Act – U.S. Environmental Protection Agency, Massachusetts Department of Environmental Protection.

Department of Conservation and Recreation (DCR) access permit – for work affecting Charles Circle

Which ENF or EIR review threshold(s) does the project meet or exceed (see 301 CMR 11.03):

☐ Land	☐ Rare Species	☐ Wetlands, Waterways, & Tidelands
☐ Water	☐ Wastewater	☒ Transportation
☐ Energy	☐ Air	☐ Solid & Hazardous Waste
☐ ACEC	☐ Regulations	☒ Historical & Archaeological Resources

Summary of Project Size & Environmental Impacts	Existing	Change	Total	State Permits & Approvals
LAND				☐ Order of Conditions ☐ Superseding Order of Conditions ☐ Chapter 91 License ☐ 401 Water Quality Certification ☒ MHD or MDC Access Permit ☐ Water Management Act Permit ☐ New Source Approval ☐ DEP or MWRA Sewer Connection/ Extension Permit ☐ Other Permits (*including Legislative Approvals*) – Specify:
Total site acreage	**7**			
New acres of land altered*		**0**		
Acres of impervious area	**7**	**0**	**7**	
Square feet of new bordering vegetated wetlands alteration		**0**		
Square feet of new other wetland alteration		**0**		
Acres of new non-water dependent use of tidelands or waterways		**0**		
STRUCTURES				
Gross square footage**	TBD	TBD	TBD	
Number of housing units	NA	NA	NA	
Maximum height (in feet)	NA	NA	NA	
TRANSPORTATION				
Vehicle trips per day	NA	-1,400 auto person-trips	-1,400 auto person-trips	
Parking spaces***	TBD	0	TBD	
WATER/WASTEWATER				
Gallons/day (GPD) of water use	NA	NA	NA	
GPD water withdrawal	NA	NA	NA	
GPD wastewater generation/ treatment	NA	NA	NA	
Length of water/sewer mains (in miles)	NA	NA	NA	

* It is assumed that all work will be conducted within areas that were previously altered.

** "TBD" indicates that impacts will be determined at a later date when design plans are further advanced.

*** The number of current on-street parking spaces will be determined during development of the SEIR. No additional parking spaces are proposed. Spaces temporarily lost during construction will be replaced.

CONSERVATION LAND: Will the project involve the conversion of public parkland or other Article 97 public natural resources to any purpose not in accordance with Article 97?

☐Yes (Specify_____) ☒No

It does not appear that any of the DCR roadway parcels or public rights of way are subject to any conservation restriction and/or Article 97 requirements. This will be confirmed during the development of the SEIR.

Will it involve the release of any conservation restriction, preservation restriction, agricultural preservation restriction, or watershed preservation restriction?

☐Yes (Specify_____) ☒No

RARE SPECIES: Does the project site include Estimated Habitat of Rare Species, Vernal Pools, Priority Sites of Rare Species, or Exemplary Natural Communities?

☐Yes (Specify_____) ☒No

HISTORICAL /ARCHAEOLOGICAL RESOURCES: Does the project site include any structure, site or district listed in the State Register of Historic Place or the inventory of Historic and Archaeological Assets of the Commonwealth?

☒Yes (Specify: see below) ☐No

A review of MassGIS files revealed that the project area along Cambridge Street lies adjacent to the Beacon Hill Historic District as designated in the State and National Registers of Historic Places. The project area also lies close to the Charles River Basin Historic District which is designated in the National Register of Historic Places. The review also revealed that two sites immediately adjacent to the project on Cambridge Street are listed on the State and National Registers of Historic Places - the Old West Church/ West End Church and the Harrison Gray Otis House. There are also six additional historic sites within one block of the corridor. No alterations to any of these structures are anticipated.

If yes, does the project involve any demolition or destruction of any listed or inventoried historic or archaeological resources?

☐Yes (Specify_____) ☒No

AREAS OF CRITICAL ENVIRONMENTAL CONCERN: Is the project in or adjacent to an Area of Critical Environmental Concern?

☐Yes (Specify_____) ☒No

PROJECT DESCRIPTION: The project description should include **(a)** a description of the project site, **(b)** a description of both on-site and off-site alternatives and the impacts associated with each alternative, and **(c)** potential on-site and off-site mitigation measures for each alternative (*You may attach one additional page, if necessary.*)

The Red Line/Blue Line Connector Project is an initiative of the Executive Office of Transportation (EOT) in coordination with the Massachusetts Bay Transportation Authority (MBTA) to implement enhancements to transit services that will improve mobility and regional access for the residents of East Boston and North Shore communities and the residents of Cambridge and the northwestern suburbs. The project will also enhance access to Massachusetts General Hospital and the surrounding medical facilities from East Boston, Revere, and the North Shore.

The proposed Red Line/Blue Line Connector Project consists of the extension of the MBTA's Blue Line under Cambridge Street to Charles/MGH Station. The project begins at the Government Center Station Blue Line platform and extends to the connection with the new Charles/MGH Station headhouse. It consists of at least three major components: 1) the realignment of the westbound Blue Line track through Bowdoin Station including the widening of the existing tunnel and the closure of the existing Bowdoin station, 2) a new rapid transit tunnel extending the Blue Line under Cambridge Street, from Joy Street to Charles Circle, and 3) a new underground Blue Line Station connected to the existing Charles/MGH Station headhouse. It may also include the construction of a new Bowdoin Station accompanied by additional modifications to existing

tunnels. The exact configurations of both the new Charles/MGH platform and potential new Bowdoin Station have not been determined.

The entire project, with the exception of parts of Bowdoin Station, lies within the right-of-way of Cambridge Street. Cambridge Street is a heavily traveled urban arterial, wider than most arterials in downtown Boston. The land use at the eastern end of the project, east of Staniford Street, is primarily state and federal government buildings. West of Staniford Street, the land use on the north side of Cambridge Street is commercial and institutional, including Massachusetts General Hospital, with the exception of two historic buildings. On the south side of the street, structures are older and smaller commercial buildings with some residences. Behind these buildings lies the Beacon Hill residential neighborhood.

As noted above, the alignment for the project is well understood and construction will be confined to Cambridge Street and the area within and above existing subway tunnels. The limits of the project are defined by 310 CMR 7.36(2)(i) to be the Blue Line at Government Center to the Red Line at Charles Station. The transportation mode to be employed is also clear. There are no practical build alternatives employing a mode other than Blue Line rapid transit. The only design alternatives to be considered are the track and platform configurations for both Charles/MGH Station and the possible Bowdoin Station replacement. Due to these known project limitations, EOT is requesting that a Single Environmental Impact Report (SEIR) be prepared for the Red Line/Blue Line Connector. The SEIR for the project will consider the following design alternatives:

1. No Action
2. Blue Line extension to Charles/MGH Station with Elimination of Bowdoin Station
3. Blue Line extension to Charles/MGH Station with Relocated Bowdoin Station

The build alternatives are expected to boost transit ridership, reduce automobile travel through downtown, improve air quality, reduce congestion in the existing downtown transfer stations, and improve mobility and economic development opportunities for residents of East Boston, Revere, Winthrop, Chelsea, Cambridge and Somerville. The build alternatives will also enhance access to Massachusetts General Hospital from East Boston, Revere, Winthrop, Chelsea, and the North Shore. The principal potential negative impacts include ongoing noise and vibration, and construction impacts resulting from cut and cover construction methods.

The SEIR will be prepared in accordance with the Secretary's Certificate on the Environmental Notification Form. The SEIR will be built on the ENF framework that responds to the Secretary's ENF Certificate. The SEIR will contain the following:

- Table of Contents
- Executive Summary
- Project History
- Description of the proposed action
  The proposed Blue Line extension will be documented in greater detail including specific new tunnel locations, relocated tunnel and station locations, new station location, new and relocated track and supporting services.
- Summary of the Alternatives considered and rationale for selection of the Preferred Alternative
  The only alternatives considered will be No Action and two variations of the Blue Line Extension to Charles/MGH. The rationale for selection of the preferred alternative will be documented, including the prior studies and the extensive public involvement process.
- Description of the existing environment
  This will include the existing land use; urban design; transportation systems; social, economic, and cultural environment; and subsurface conditions
- Description of project impacts due to construction and operations
  The SEIR will document the expected improvements in mobility, traffic congestion and air quality resulting from the operation of Red Line/Blue Line Connector, while also documenting any construction and ongoing impacts resulting from the project and mitigation measures to reduce these impacts. With the refinement of the station designs and track relocations, the SEIR will be able to address the impacts that would result from construction activities. Any impacts on access to businesses, institutions, and residences, during or after construction, will be documented. Impacts on noise, vibration, and the

visual environment will also be documented. Mitigation measures for hazardous materials affected by construction will be identified.

- Proposed Section 61 Findings (mitigation commitments)
- Comment letters on the EENF and responses to comments
- Supporting graphics, including project location, existing conditions (sensitive receptors, environmental impacts including visual environment, cultural resources, traffic volumes and patterns), conceptual design (cross-sections, platforms and stations, streetscape), and mitigation elements.
- Technical Appendix, noise and vibration analyses
- Technical Appendix, air quality analysis
- Technical Appendix, geotechnical analysis
- Technical Appendix, traffic analysis

This EENF will be filed in September 2007 with the SEIR completed by April 2010. Final Design will be completed by December 2011. For planning purposes it is assumed that construction would begin in 2013 and be completed in 2017, if a decision is made to advance the project. The planning horizon for the SEIR will be the year 2030.

Additional descriptions of the project are contained in Attachments 2 and 5. Attachment 2 describes the proposed project in more detail. Attachment 5.1 is the Executive Summary from the 1987 engineering and environmental study conducted by Howard Needles Tammen & Bergendoff (HNTB). Attachment 5.2 summarizes the analyses conducted for the MBTA's 2003 Program for Mass Transportation and revised for the most recent regional transportation plan. Attachment 5.3 presents documentation on the need to re-align the westbound Blue Line track through Bowdoin Station. Attachment 5.4 presents additional current environmental information developed for the purposes of filing this EENF.

LAND SECTION – all proponents must fill out this section

I. Thresholds / Permits

A. Does the project meet or exceed any review thresholds related to land (see 301 CMR 11.03(1)
___ Yes **_X_** No; if yes, specify each threshold:

II. Impacts and Permits

A. Describe, in acres, the current and proposed character of the project site, as follows:

	Existing	Change	Total
Footprint of buildings	0	0	0
Roadways, parking, and other paved areas	7	0	7
Other altered areas (describe)	0	0	0
Undeveloped areas	0	0	0

B. Has any part of the project site been in active agricultural use in the last three years?
___ Yes **_X_** No; if yes, how many acres of land in agricultural use (with agricultural soils) will be converted to nonagricultural use?

C. Is any part of the project site currently or proposed to be in active forestry use?
___ Yes **_X_** No; if yes, please describe current and proposed forestry activities and indicate whether any part of the site is the subject of a DEM-approved forest management plan:

D. Does any part of the project involve conversion of land held for natural resources purposes in accordance with Article 97 of the Amendments to the Constitution of the Commonwealth to any purpose not in accordance with Article 97? ___ Yes _X_ No; if yes, describe:

E. Is any part of the project site currently subject to a conservation restriction, preservation restriction, agricultural preservation restriction or watershed preservation restriction? __Yes _X_No; if yes, does the project involve the release or modification of such restriction? ___ Yes ___ No; if yes, describe:

F. Does the project require approval of a new urban redevelopment project or a fundamental change in an existing urban redevelopment project under M.G.L.c.121A? ___ Yes **_X_** No; if yes, describe:

G. Does the project require approval of a new urban renewal plan or a major modification of an existing urban renewal plan under M.G.L.c.121B? ___Yes __**X**_ No ; if yes, describe:

H. Describe the project's stormwater impacts and, if applicable, measures that the project will take to comply with the standards found in DEP's Stormwater Management Policy:

In the design phase, predevelopment conditions will be assessed and post development conditions will be designed to meet or improve the predevelopment conditions. A Stormwater Management Plan will be developed in accordance with DEP's Stormwater Management Policy. Currently stormwater is handled in closed systems in the project area. Any modifications will need to consider DEP's best management practices including offline systems, oil water separators, drainage channels, catch basin sumps, detention, and other means of reducing total suspended solids in the proposed system. Drainage for the new tunnel will also be addressed and incorporated into the design. Disturbance of groundwater levels may occur during construction of the proposed tunnel extension. These groundwater effects, including anticipated changes in the groundwater level due to displacement from the new tunnel, are to be incorporated into the Stormwater Management Plan.

I. Is the project site currently being regulated under M.G.L.c.21E or the Massachusetts Contingency Plan? ___Yes _**X**__ No ; if yes, what is the Release Tracking Number (RTN)?

Implementation of the Red Line/Blue Line Connector project is not expected to involve land alterations that could affect sites regulated under M.G.L. c.21E. As described in the Project Plan and Description in Attachment 2, the Preferred Alternative would involve the extension of a subway tunnel and a new subway station, including modification of an existing headhouse building. It may involve the reconstruction of an existing subway station. A review of M.G.L. c.21E sites conducted during the preparation of the Environmental Notification Form found a number of regulated sites less than a mile from the project corridor (see Hazardous Sites map in Attachment 5.4), but only four sites immediately adjacent to the corridor. These sites are shown in Attachment 5.4. Due to the limited extent of land alteration that will be required beyond the existing street right-of-way, it appears unlikely that sites regulated under M.G.L. c.21E will be affected. However, new reviews of M.G.L. c.21E sites will need to be conducted as project design progresses and take into account new site detection and remediation of existing sites.

Analyses for the 1987 engineering study for the project indicated "a discontinuous distribution of various contaminants in the soil, particularly the fill. Specifically, petroleum hydrocarbons (PHC's), polycyclic aromatic hydrocarbons (PAH's), lead, 3,3'-dichlorobenzidine, and oil and grease are of potential concern. The contamination pattern, however, does not suggest a single concentrated source for most of the contaminants." This will require on-site testing of soil prior to disposal.

J. Is the project site within the Chicopee or Nashua watershed, is it within the Quabbin, Ware, or Wachusett subwatershed? ___ Yes X No; if yes, is the project site subject to regulation under the Watershed Protection Act? ___ Yes ___ No

K. Describe the project's other impacts on land:

Refer to Attachments 2 and 5 for additional information

III.. Consistency

A. Identify the current municipal comprehensive land use plan and the open space plan and describe the consistency of the project and its impacts with that plan(s):

The City of Boston has enacted several land use plans, area plans, and open space plans and conducted a number of planning efforts in recent years that are relevant to the proposed project. Massachusetts General Hospital (MGH), which is directly adjacent to the project corridor, recently completed an Institutional Master Plan. In addition, the City of Boston has also worked with developers on several major development projects to revitalize the Cambridge Street corridor in recent years. The following is a list of municipal land use plans, open space plans, institutional plans and other planning efforts relevant to the Red Line/Blue Line Connector project:

- A Framework for Planning and Development of the West End Area, prepared by the Boston Redevelopment Authority in cooperation with the West End Area Planning Group and the Boston Transportation Department, July 2003.
- Boston 400: Connecting the City and Its People, a comprehensive, long-term planning effort for all of the city's neighborhoods carried out by the Boston Redevelopment Authority; began in 1997 and entailed hundreds of community meetings and much discussion about the future of the neighborhoods and the city; the report was never published, but a draft version for comment was developed.
- Open Space Plan 2002-2006, Boston Parks and Recreation Department, September 2002.
- Fostering Transit-Oriented Development in Boston, ongoing planning initiative by the Boston Redevelopment Authority begun in 2003.
- Massachusetts General Hospital Institutional Master Plan, Massachusetts General Hospital, approved by the Boston Redevelopment Authority in November 2006.

In addition to these plans and efforts, significant recent developments in which the City of Boston has worked with developers to contribute to the revitalization of the Cambridge Street corridor have included:

- Redevelopment of Charles River Plaza, on Cambridge Street near Staniford Street, including redevelopment of 650,000 square feet of existing space, construction of more than 400,000 square feet of new space in two buildings, and the addition of 10,000 square feet of retail space including a new supermarket.
- Revitalization of the Saltonstall Building, at 100 Cambridge Street, including construction of 75 new units of housing and 35,000 square feet of retail space
- Redevelopment of the former Charles Street Jail, adjacent to the MGH Yawkey Center for Outpatient Care, into a 305-room, 239,000 square foot hotel.

Together, the plans developed by the City encourage compact, mixed-use development and revitalization of lands around the study corridor, as well as transit-oriented development and linkages between open space and mass transit. The City's recent efforts with developers in the study corridor have worked toward similar goals, and the Massachusetts General Hospital Master Plan promotes compact development on its West End Campus, including a new 10-story building that would be located behind the Yawkey Center for Outpatient Care.

The purpose of the Red Line/Blue Line Connector project is to boost transit ridership, reduce automobile travel through the downtown, improve air quality, reduce congestion in the existing downtown transfer stations, and improve mobility and economic development opportunities for residents of East Boston, Revere, Winthrop, Chelsea, Cambridge and Somerville. The proposed Red Line/Blue Line Connector project is consistent with, and highly supportive of, the land use and open space plans of the City of Boston as well as the Massachusetts General Hospital Institutional Master Plan. The proposed impacts of the Red Line/Blue Line Connector project are highly beneficial in terms of transportation access and mobility, air quality and the environment, and land use and economic development, and are all consistent with these municipal and institutional plans and policies.

B. Identify the current Regional Policy Plan of the applicable Regional Planning Agency and describe the consistency of the project and its impacts with that plan:

The most recent regional policy plan for the Boston region is MetroPlan 2000, which was completed in 1990 by the Metropolitan Area Planning Council (MAPC). The basic tenet of the plan was that concentrating development is economically and environmentally more practical than the current model of scattered growth. MetroPlan 2000 emphasized that concentrated development encourages and enhances transit use, ride sharing and pedestrian traffic with a resultant reduction in automobile travel, traffic congestion, air pollution and fuel consumption, and in addition, reduces the pressure to develop open space and environmentally sensitive lands.

MAPC is currently in the process of updating the regional policy plan through MetroFuture, an extensive participatory initiative to develop a vision for the metropolitan Boston region's growth through 2030. Through the MetroFuture process, participants developed four scenarios for growth in the Boston region, including one that would extend current growth trends and three alternate scenarios that would direct growth in a more compact way (with differences in the degree and pace of change). Through 2006 and into 2007, the MetroFuture team traveled across the region to share findings on what the region might look like through 2030 if current trends continue, and to present the alternative futures. More than 100 discussions were held with groups across the region over this period.

On May 1, 2007, MetroFuture's Recommended Plan for a Greater Boston Region was ratified by 94% of the 400 participants in a Boston College Citizen Seminar. The recommended growth plan envisions a future in which growth is focused in areas that can meet the needs of new residents. It envisions more urban "starter homes" in the Inner Core and Regional Urban Centers; suburban growth steered to town centers and villages on previously developed land; and clustering of housing in rural areas to protect open space. In the Inner Core and Regional Urban Centers, the Recommended Plan also envisions increased transit, more parks and shops, revitalized main streets, and new pathways opening up access to recreational and natural areas.

The MetroFuture project has contributed significantly to the Boston Region MPO's recent development of a new regional transportation plan. The work associated with MetroFuture provided the MPO with the population and employment data needed for it to select its land use for the adopted plan, which again proposes smart growth strategies. In the final phase of the MetroFuture project, stakeholders and the public will assess how the regional plan will be implemented.

The Commonwealth of Massachusetts has adopted a set of Sustainable Development Principles which are intended to promote sustainable development through integrated energy and environment, housing and economic development, transportation and other policies, programs, investments, and regulations. Several of these principles are particularly relevant to the Red Line/Blue Line Connector project: 1. Concentrate Development and Mix Uses; 2. Advance Equity; 7. Provide Transportation Choice; 8.Increase Job and Business Opportunities; and 10. Plan Regionally.

The proposed Red Line/Blue Line Connector project is consistent with, and highly supportive of, the policies in MetroPlan 2000, the Recommended Plan for a Greater Boston Region that was recently ratified through the ongoing MetroFuture planning process, and the Commonwealth's Sustainable Development Principles. The Red/Blue Connector would enhance many of the elements identified for the Inner Core and Regional Urban centers in the Recommended Plan for a Greater Boston Region. The proposed impacts of the Red Line/Blue Line Connector project, of increasing transit ridership, encouraging a shift from auto travel, and supporting compact development, are also consistent with the regional land use policy plan.

C. Will the project require any approvals under the local zoning by-law or ordinance (i.e. text or map amendment, special permit, or variance)? Yes ___ No X ; if yes, describe:

D. Will the project require local site plan or project impact review?
___ Yes X No; if yes, describe:

RARE SPECIES SECTION

I. Thresholds / Permits

A. Will the project meet or exceed any review thresholds related to rare species or habitat (see 301 CMR 11.03(2))? ___ Yes __X__ No; if yes, specify, in quantitative terms:

B. Does the project require any state permits related to rare species or habitat? ___ Yes __X__ No

C. If you answered "No" to both questions A and B, proceed to the Wetlands, Waterways, and Tidelands Section. If you answered "Yes" to either question A or question B, fill out the remainder of the Rare Species section below.

II. Impacts and Permits

A. Does the project site fall within Priority or Estimated Habitat in the current Massachusetts Natural Heritage Atlas (attach relevant page)? ___ Yes ___ No. If yes,

1. Which rare species are known to occur within the Priority or Estimated Habitat (contact: Environmental Review, Natural Heritage and Endangered Species Program, Route 135, Westborough, MA 01581, allowing 30 days for receipt of information):
2. Have you surveyed the site for rare species? ___ Yes ___ No; if yes, please include the results of your survey.
3. If your project is within Estimated Habitat, have you filed a Notice of Intent or received an Order of Conditions for this project? ___ Yes ___ No; if yes, did you send a copy of the Notice of Intent to the Natural Heritage and Endangered Species Program, in accordance with the Wetlands Protection Act regulations? ___ Yes ___ No

B. Will the project "take" an endangered, threatened, and/or species of special concern in accordance with M.G.L. c.131A (see also 321 CMR 10.04)? ___ Yes ___ No; if yes, describe:

C. Will the project alter "significant habitat" as designated by the Massachusetts Division of Fisheries and Wildlife in accordance with M.G.L. c.131A (see also 321 CMR 10.30)? ___ Yes ___ No; if yes, describe:

D. Describe the project's other impacts on rare species including indirect impacts (for example, stormwater runoff into a wetland known to contain rare species or lighting impacts on rare moth habitat):

WETLANDS, WATERWAYS, AND TIDELANDS SECTION

I. Thresholds / Permits

A. Will the project meet or exceed any review thresholds related to wetlands, waterways, and tidelands (see 301 CMR 11.03(3))? ___ Yes __X__ No; if yes, specify, in quantitative terms:

While the westernmost portion of the project area (roughly west of Anderson St.) was once a tidal marsh that was filled in the first half of the 19th century, the area does not appear to meet the criteria for filled tidelands under Chapter 91. An earlier version of the proposed project received a confirmation in 1986 from Department of Environmental Quality Engineering (DEQE), Wetlands and Waterways Regulation that a Chapter 91 license was not required.

B. Does the project require any state permits (or a local Order of Conditions) related to wetlands, waterways, or tidelands? ___ Yes __X__ No; if yes, specify which permit:

C. If you answered "No" to both questions A and B, proceed to the Water Supply Section. If you answered "Yes" to either question A or question B, fill out the remainder of the Wetlands, Waterways, and Tidelands Section below.

II. Wetlands Impacts and Permits

A. Describe any wetland resource areas currently existing on the project site and indicate them on the site plan:

B. Estimate the extent and type of impact that the project will have on wetland resources, and indicate whether the impacts are temporary or permanent:

Coastal Wetlands	Area (in square feet) or Length (in linear feet)
Land Under the Ocean	_____
Designated Port Areas	_____
Coastal Beaches	_____
Coastal Dunes	_____
Barrier Beaches	_____
Coastal Banks	_____
Rocky Intertidal Shores	_____
Salt Marshes	_____
Land Under Salt Ponds	_____
Land Containing Shellfish	_____
Fish Runs	_____
Land Subject to Coastal Storm Flowage	_____
Inland Wetlands	
Bank	_____
Bordering Vegetated Wetlands	_____
Land under Water	_____
Isolated Land Subject to Flooding	_____
Bordering Land Subject to Flooding	_____
Riverfront Area	_____

C. Is any part of the project
1. a limited project? ___ Yes ___ No
2. the construction or alteration of a dam? ___ Yes ___ No; if yes, describe:
3. fill or structure in a velocity zone or regulatory floodway? ___ Yes ___ No
4. dredging or disposal of dredged material? ___ Yes ___ No; if yes, describe the volume of dredged material and the proposed disposal site:
5. a discharge to Outstanding Resource Waters? ___ Yes ___ No
6. subject to a wetlands restriction order? ___ Yes ___ No; if yes, identify the area (in square feet):

D. Does the project require a new or amended Order of Conditions under the Wetlands Protection Act (M.G.L. c.131A)? ___ Yes ___ No; if yes, has a Notice of Intent been filed or a local Order of Conditions issued? ___ Yes ___ No; if yes, list the date and DEP file number:_____. Was the Order of Conditions appealed? ___ Yes ___ No. Will the project require a variance from the Wetlands regulations? ___ Yes ___ No.

E. Will the project:
   1. be subject to a local wetlands ordinance or bylaw? ___ Yes ___ No
   2. alter any federally-protected wetlands not regulated under state or local law? ___ Yes ___ No; if yes, what is the area (in s.f.)?

F. Describe the project's other impacts on wetlands (including new shading of wetland areas or removal of tree canopy from forested wetlands):

III. Waterways and Tidelands Impacts and Permits

A. Is any part of the project site waterways or tidelands (including filled former tidelands) that are subject to the Waterways Act, M.G.L.c.91? ___ Yes No; if yes, is there a current Chapter 91 license or permit affecting the project site? ___ Yes No; if yes, list the date and number:

B. Does the project require a new or modified license under M.G.L.c.91? ___ Yes No; if yes, how many acres of the project site subject to M.G.L.c.91 will be for non-water dependent use?
   Current ___ Change ___ Total ___

C. Is any part of the project
   1. a roadway, bridge, or utility line to or on a barrier beach? ___ Yes ___ No; if yes, describe:
   2. dredging or disposal of dredged material? ___ Yes ___ No; if yes, volume of dredged material _____
   3. a solid fill, pile-supported, or bottom-anchored structure in flowed tidelands or other waterways? ___ Yes ___ No; if yes, what is the base area? _____
   4. within a Designated Port Area? ___ Yes ___ No

D. Describe the project's other impacts on waterways and tidelands:

IV. Consistency:

A. Is the project located within the Coastal Zone? ___ Yes No; if yes, describe the project's consistency with policies of the Office of Coastal Zone Management:

B. Is the project located within an area subject to a Municipal Harbor Plan? ___ Yes No; if yes, identify the Municipal Harbor Plan and describe the project's consistency with that plan:

WATER SUPPLY SECTION

I. Thresholds / Permits

A. Will the project meet or exceed any review thresholds related to water supply (see 301 CMR 11.03(4))? ___ Yes **_X_** No; if yes, specify, in quantitative terms:

B. Does the project require any state permits related to water supply? ___ Yes **_X_** No; if yes, specify which permit:

C. If you answered "No" to both questions A and B, proceed to the Wastewater Section. If you answered "Yes" to either question A or question B, fill out the remainder of the Section below.

II. Impacts and Permits

A. Describe, in gallons/day, the volume and source of water use for existing and proposed activities at the project site:

	Existing	Change	Total
Withdrawal from groundwater	_____	_____	_____
Withdrawal from surface water	_____	_____	_____
Interbasin transfer	_____	_____	_____
Municipal or regional water supply	_____	_____	_____

B. If the source is a municipal or regional supply, has the municipality or region indicated that there is adequate capacity in the system to accommodate the project? ___ Yes ___ No

C. If the project involves a new or expanded withdrawal from a groundwater or surface water source,
   1. have you submitted a permit application? ___ Yes ___ No; if yes, attach the application
   2. have you conducted a pump test? ___ Yes ___ No; if yes, attach the pump test report

D. What is the currently permitted withdrawal at the proposed water supply source (in gallons/day)? Will the project require an increase in that withdrawal?___ Yes ___ No

E. Does the project site currently contain a water supply well, a drinking water treatment facility, water main, or other water supply facility, or will the project involve construction of a new facility? ___ Yes ___ No. If yes, describe existing and proposed water supply facilities at the project site:

	Existing	Change	Total
Water supply well(s) (capacity, in gpd)	_____	_____	_____
Drinking water treatment plant (capacity, in gpd)	_____	_____	_____
Water mains (length, in miles)	_____	_____	_____

F. If the project involves any inter-basin transfer of water, which basins are involved, what is the direction of the transfer, and is the inter-basin transfer existing or proposed?

G. Does the project involve
   1. new water service by a state agency to a municipality or water district? ___ Yes ___ No
   2. a Watershed Protection Act variance? ___ Yes ___ No; if yes, how many acres of alteration?
   3. a non-bridged stream crossing 1,000 or less feet upstream of a public surface drinking water supply for purpose of forest harvesting activities? ___ Yes ___ No

H. Describe the project's other impacts (including indirect impacts) on water resources, quality, facilities and services:

III. Consistency - Describe the project's consistency with water conservation plans or other plans to enhance water resources, quality, facilities and services:

WASTEWATER SECTION

I. Thresholds / Permits

A. Will the project meet or exceed any review thresholds related to wastewater (see 301 CMR 11.03(5))? ___ Yes __X__ No; if yes, specify, in quantitative terms:

B. Does the project require any state permits related to wastewater? ___ Yes __X__ No; if yes, specify which permit:

C. If you answered "No" to both questions A and B, proceed to the **Transportation -- Traffic Generation Section**. If you answered "Yes" to either question A or question B, fill out the remainder of the Wastewater Section below.

II. Impacts and Permits

A. Describe, in gallons/day, the volume and disposal of wastewater generation for existing and proposed activities at the project site (calculate according to 310 CMR 15.00):

	Existing	Change	Total
Discharge to groundwater (Title 5)	_____	_____	_____
Discharge to groundwater (non-Title 5)	_____	_____	_____
Discharge to outstanding resource water	_____	_____	_____
Discharge to surface water	_____	_____	_____
Municipal or regional wastewater facility	_____	_____	_____
TOTAL	_____	_____	_____

B. Is there sufficient capacity in the existing collection system to accommodate the project? ___ Yes ___ No; if no, describe where capacity will be found:

C. Is there sufficient existing capacity at the proposed wastewater disposal facility? ___ Yes ___ No; if no, describe how capacity will be increased:

D. Does the project site currently contain a wastewater treatment facility, sewer main, or other wastewater disposal facility, or will the project involve construction of a new facility? ___ Yes ___ No. If yes, describe as follows:

	Existing	Change	Total
Wastewater treatment plant (capacity, in gpd)	_____	_____	_____
Sewer mains (length, in miles)	_____	_____	_____
Title 5 systems (capacity, in gpd)	_____	_____	_____

E. If the project involves any inter-basin transfer of wastewater, which basins are involved, what is the direction of the transfer, and is the inter-basin transfer existing or proposed?

F. Does the project involve new sewer service by an Agency of the Commonwealth to a municipality or sewer district? ___ Yes ___ No

G. Is there any current or proposed facility at the project site for the storage, treatment, processing, combustion or disposal of sewage sludge, sludge ash, grit, screenings, or other sewage residual materials? ___ Yes ___ No; if yes, what is the capacity (in tons per day):

	Existing	Change	Total
Storage	_____	_____	_____
Treatment, processing	_____	_____	_____
Combustion	_____	_____	_____
Disposal	_____	_____	_____

H. Describe the project's other impacts (including indirect impacts) on wastewater generation and treatment facilities:

III. Consistency -- Describe measures that the proponent will take to comply with federal, state, regional, and local plans and policies related to wastewater management:

A. If the project requires a sewer extension permit, is that extension included in a comprehensive wastewater management plan? ___ Yes ___ No; if yes, indicate the EOEA number for the plan and describe the relationship of the project to the plan

TRANSPORTATION -- TRAFFIC GENERATION SECTION

I. Thresholds / Permits

A. Will the project meet or exceed any review thresholds related to traffic generation (see 301 CMR 11.03(6))? _X_ Yes ___ No; if yes, specify, in quantitative terms:

A Mandatory EIR is required for this project pursuant to 11.03 (6) (a) (5). This project requires an approximately 1,400' extension of an existing underground rapid transit line underneath an existing roadway right-of-way. The project would result in a net reduction in the number of person-trips by automobile and the number of vehicle-miles traveled (VMT) when compared to the No Build Alternative.

B. Does the project require any state permits related to state-controlled roadways? **_X_** Yes ___No; if yes, specify which permit:

Department of Conservation and Recreation (DCR) access permit

C. If you answered "No" to both questions A and B, proceed to the **Roadways and Other Transportation Facilities** Section. If you answered "Yes" to either question A or question B, fill out the remainder of the Traffic Generation Section below.

II. Traffic Impacts and Permits

A. Describe existing and proposed vehicular traffic generated by activities at the project site:

The project will result in a net reduction of vehicle trips in comparison to the No Build Alternative. As summarized in Attachment 5.2, the 2003 Program for Mass Transportation estimated that 2,800 new daily transit trips would be generated by the project. Subsequent refinements of the ridership estimates done for the MBTA in 2005 estimated that 3,100 new daily transit trips would be generated; of these 1,700 are expected to be walk trips diverted to transit. Thus, an estimated 1,400 daily auto person trips would be diverted.

The project is not expected to result in a change in the number of buses operating on local streets. The beneficiaries of the project would be primarily existing Red Line and Blue Line rapid transit users who would be diverted from congested downtown segments of the Green and Orange Lines. New transit riders diverted from the automobile may use local buses to access the Red and/or Blue Lines. However, the impacts are likely to be spread over many different bus routes and therefore service levels and the resulting bus volumes on local streets are likely to be unchanged.

The primary mode of access to the new Blue Line station would be by walking or by transfer from the Red Line inside the expanded Charles/MGH Station. Given the urban location of the station and constrained parking availability in the area, access by automobile is not expected. Temporary construction impacts on the number of on-street resident and general parking spaces will be determined as the project progresses.

	Existing	Change	Total
Number of parking spaces	0	0	0
Number of vehicle trips per day	TBD	-1,400 auto person trips *	TBD

* This figure represents the number of new transit riders generated by the project and diverted from the auto mode, as projected in a May 2005 memo by the Central Transportation Planning Staff (CTPS) for the MBTA.

B. What is the estimated average daily traffic on roadways serving the site?

Roadway	Existing	Change	Total
Cambridge St. west of Yawkey Center driveway	37,800	TBD	TBD
Cambridge St. west of North Grove Street	31,300	TBD	TBD
North Grove Street north of Cambridge Street	7,200	TBD	TBD
North Anderson Street north of Cambridge Street	2,700	TBD	TBD
Blossom Street north of Cambridge Street	8,500	TBD	TBD

Source: Institutional Master Plan – Massachusetts General Hospital; Transportation Access Plan; Vanasse Hangen Brustlin, Inc.; August 11, 2006.

C. Describe how the project will affect transit, pedestrian and bicycle transportation facilities and services:

The project will expand transit facilities and increase transit usage in the study area. The efficiency of the regional rapid transit system will be improved through the elimination of transfers at subway stations in the central area. This will decrease the number of transfers at Park Street, Government Center, Downtown Crossing and State and reduce the volume of Green Line passengers between Park Street and Government Center and Orange Line passengers between Downtown Crossing and State. More precise estimates of projected impacts will be calculated as the project progresses.

No existing pedestrian or bicycle facilities will be disrupted by the project. No new station entrances will be constructed. Access to the proposed Blue Line Charles/MGH Station will be through the existing headhouse. This headhouse was constructed to accommodate a future Blue Line Station connection. The project is likely to result in additional pedestrian traffic crossing Cambridge Street at the headhouse.

III. Consistency -- Describe measures that the proponent will take to comply with municipal, regional, state, and federal plans and policies related to traffic, transit, pedestrian and bicycle transportation facilities and services:

The City of Boston's Citywide Transportation Plan, called Access Boston 2000 – 2010, focuses on quality of life and economic growth; community building; intermodal transportation; and enhancing local and regional transportation connections. The public transportation portion of the Access Boston 2000 - 2010 plan identifies several City transit investment priorities: rapid transit services for Boston residents; regional services to reduce auto traffic; and intermodal centers to improve connectivity.

The Boston Region Metropolitan Transportation Planning Organization's recently-adopted Regional Transportation Plan, entitled Journey to 2030, includes a number of vision statements for the region's transportation system. These include preserving the existing transportation network and replacing systems once their life span is realized; giving users of the region's transportation system increased opportunities for convenient, reliable speedy, affordable, and accessible travel through a coordinated mix of transportation modes and services; striving to reduce air quality degradation and other environmental degradations caused by transportation; protecting the region from natural and human threats; assessing the needs of low-income and minority residents so they share quality in access to the transportation network; serving businesses, residential, and mixed-use centers with multimodal transportation investments; and other goals.

The proposed Red Line/Blue Line Connector project is consistent with and highly supportive of plans and policies at all levels relating to transportation, traffic, pedestrian and bicycle transportation facilities and services. The proposed project would result in a substantial reduction of automobile trips and an increase in transit ridership, would improve mobility and connectivity between transit lines, and would further enhance the multimodal transportation system in the study area.

Consistency with the region's Transportation Improvement Program (TIP), the State Implementation Plan (SIP), and other state plans regarding transportation facilities is discussed in the following section on Roadways and other Transportation Facilities.

ROADWAYS AND OTHER TRANSPORTATION FACILITIES SECTION

I. Thresholds

A. Will the project meet or exceed any review thresholds related to **roadways or other transportation facilities** (see 301 CMR 11.03(6))? X Yes ___ No; if yes, specify, in quantitative terms:

A Mandatory EIR is required for this project pursuant to 11.03 (6) (a) (5). This project requires an approximately 1,400' extension of an existing underground rapid transit line underneath an existing roadway right-of-way. The project would result in a net reduction in the number of person-trips by automobile and the number of vehicle-miles traveled (VMT) when compared to the No Build Alternative.

B. Does the project require any state permits related to **roadways or other transportation facilities**? X Yes ___ No; if yes, specify which permit:

Department of Conservation Resources (DCR) access permit

C. If you answered "No" to both questions A and B, proceed to the **Energy Section**. If you answered "Yes" to either question A or question B, fill out the remainder of the Roadways Section below.

II. Transportation Facility Impacts

A. Describe existing and proposed transportation facilities at the project site:

	Existing	Change	Total
Length (in linear feet) of new or widened roadway	0	0	0
Width (in feet) of new or widened roadway		0	

Other transportation facilities:

The project will be constructed underneath an existing urban street. The project will result in the temporary reduction in roadway capacity and parking capacity during construction. Permanent roadway changes are not expected.

The project will extend the MBTA Blue Line to an additional station at Charles/MGH. A new pedestrian connection between the Red and Blue Line platforms will be constructed. A more detailed description of the changes in public transportation facilities is contained in Attachment 2.

B. Will the project involve any

1. Alteration of bank or terrain (in linear feet)? No
2. Cutting of living public shade trees (number)? TBD *
3. Elimination of stone wall (in linear feet)? No

* The re-alignment of the westbound Blue Line track through Bowdoin Station will require cut and cover tunneling which could result in the removal of established trees in Bowdoin Square. Outside Bowdoin Square, trees recently planted in the median would have to be removed during construction. All trees and altered landscaping would be restored after construction.

III. Consistency -- Describe the project's consistency with other federal, state, regional, and local plans and policies related to traffic, transit, pedestrian and bicycle transportation facilities and services, including consistency with the applicable regional transportation plan and the Transportation Improvements Plan (TIP), the State Bicycle Plan, and the State Pedestrian Plan:

The Commonwealth of Massachusetts, the Boston Region Metropolitan Planning Organization, and the City of Boston have developed a number of planning and policy documents in recent years regarding transportation facilities, including roadways, transit, pedestrian and bicycle facilities and services. The following is a list of state, regional, and local transportation planning efforts regarding transportation facilities that are relevant to the Red Line/Blue Line Connector project:

- Massachusetts State Implementation Plan for Carbon Monoxide, Massachusetts State Implementation Plan for Nitrogen Oxide, and Massachusetts State Implementation Plan for Ozone, Massachusetts Department of Environmental Protection
- Commonwealth of Massachusetts Long-Range Transportation Plan, Executive Office of Transportation – Office of Transportation Planning, 2006
- Massachusetts Pedestrian Transportation Plan, Massachusetts Highway Department, 1998
- Massachusetts Statewide Bicycle Transportation Plan, Massachusetts Highway Department, 1998 (2007 plan currently being prepared)
- Transportation Improvement Program and Air Quality Conformity Determination Fiscal Years 2008-2011, Boston Region Metropolitan Planning Organization, August 2007
- Journey to 2030: Transportation Plan of the Boston Region Metropolitan Planning Organization, Boston Region Metropolitan Planning Organization, April 2007
- Program for Mass Transportation, Massachusetts Bay Transportation Authority, January 2004
- Access Boston 2000 – 2010, Boston Transportation Department, 2000

The Massachusetts Department of Environmental Protection (DEP) has developed a Clean Air Act State Implementation Plan (SIP) that contains procedures and programs to monitor, control, maintain and enforce compliance with all national air quality standards. Specific transit improvement projects are included in the SIP. Implementation of these projects is required in order to provide air quality benefits to the region. The Red Line/Blue Line Connector is included in the set of SIP commitments. Over the past few years, EOT and DEP have re-evaluated the projects that have not yet been built to ensure that any further investments fund the best regionally significant projects to meet air quality goals and requirements. This process, which has been ongoing, included public outreach and air quality goal-setting, and an evaluation of the original and alternative SIP projects. DEP has promulgated a new set of transit regulations (310 CMR 7.36) and submitted them to the U.S. Department of Environmental Protection (USEPA) as a SIP revision. These revisions include a commitment to complete the final design of the Red Line/Blue Line Connector by the end of 2011. The SIP revisions are now being reviewed by USEPA.

The Commonwealth's Long-Range Transportation Plan includes the SIP Commitments as part of its Project Recommendations for the Boston Region, while noting that EOT has requested that DEP re-evaluate the three outstanding SIP commitments.

The Boston MPO's Journey to 2030 plan includes the Red Line/Blue Line Connector in the Recommended Plan because as of the date of the Regional Transportation Plan (April 2007), the Red Line/Blue Line Connector was a current State Implementation Plan (SIP) project.

The proposed Red Line/Blue Line Connector project is consistent with the other state, regional, and local plans and policies related to transportation facilities including transit, pedestrian and bicycle facilities and services. The proposed project would boost transit ridership, reduce automobile travel through the downtown, improve air quality, reduce congestion in the existing downtown transfer stations, and improve mobility and economic development opportunities for residents of East Boston, Revere, Winthrop, Chelsea, Cambridge and Somerville.

ENERGY SECTION

I. Thresholds / Permits

A. Will the project meet or exceed any review thresholds related to energy (see 301 CMR 11.03(7))? ___ Yes **__X__** No; if yes, specify, in quantitative terms:

B. Does the project require any state permits related to energy? ___ Yes _ X_ No; if yes, specify which permit:

C. If you answered "No" to both questions A and B, proceed to the **Air Quality Section**. If you answered "Yes" to either question A or question B, fill out the remainder of the Energy Section below.

II. Impacts and Permits

A. Describe existing and proposed energy generation and transmission facilities at the project site:

	Existing	Change	Total
Capacity of electric generating facility (megawatts)	_____	_____	_____
Length of fuel line (in miles)	_____	_____	_____
Length of transmission lines (in miles)	_____	_____	_____
Capacity of transmission lines (in kilovolts)	_____	_____	_____

B. If the project involves construction or expansion of an electric generating facility, what are
   1. the facility's current and proposed fuel source(s)?
   2. the facility's current and proposed cooling source(s)?

C. If the project involves construction of an electrical transmission line, will it be located on a new, unused, or abandoned right of way?___ Yes ___ No; if yes, please describe:

D. Describe the project's other impacts on energy facilities and services:

III. Consistency -- Describe the project's consistency with state, municipal, regional, and federal plans and policies for enhancing energy facilities and services:

AIR QUALITY SECTION

I. Thresholds

A. Will the project meet or exceed any review thresholds related to **air quality** (see 301 CMR 11.03(8))? ___ Yes __X__ No; if yes, specify, in quantitative terms:

B. Does the project require any state permits related to **air quality**? ___ Yes __X__ No; if yes, specify which permit:

C. If you answered "No" to both questions A and B, proceed to the **Solid and Hazardous Waste** Section. If you answered "Yes" to either question A or question B, fill out the remainder of the Air Quality Section below.

II. Impacts and Permits

A. Does the project involve construction or modification of a major stationary source (see 310 CMR 7.00, Appendix A)?___ Yes ___ No; if yes, describe existing and proposed emissions (in tons per day) of:

	Existing	Change	Total
Particulate matter	_____	_____	_____
Carbon monoxide	_____	_____	_____
Sulfur dioxide	_____	_____	_____
Volatile organic compounds	_____	_____	_____
Oxides of nitrogen	_____	_____	_____
Lead	_____	_____	_____
Any hazardous air pollutant	_____	_____	_____
Carbon dioxide	_____	_____	_____

B. Describe the project's other impacts on air resources and air quality, including noise impacts:

The proposed Red Line/Blue Line Connector project would result in a net improvement in air quality compared to the No-Build case due to the diversion of automobile trips to transit. Several estimates of air quality benefits due to the project have been developed in recent years. The estimates vary somewhat due to minor differences in modeling assumptions and air quality emissions factors, but all modeling estimates show reductions in emissions for Carbon Monoxide (CO), Oxides of Nitrogen (NOx), and Volatile Organic Compounds (VOC emissions). Air quality impacts during construction will be determined during subsequent stages of the environmental review process.

The proposed project will result in some noise and vibration impacts, both during and after construction. Cut and cover construction methods will result in noise and vibration impacts on the surrounding area. The completed project will be entirely underground; however, noise from passing trains could reach the street through station entrances and ventilation shafts. Vibration from passing trains may be felt on the street and in surrounding structures. More detail on the noise and vibration impacts of the proposed project will be determined during subsequent stages of the environmental review process.

III. Consistency

A. Describe the project's consistency with the State Implementation Plan:

As noted in the Roadways and Other Transportation Facilities section of this EENF, the Red Line/Blue Line Connector was included in the set of CA/T commitments in the SIP. Over the past few years, EOT and DEP have re-evaluated the remaining projects that have not yet been built to ensure that any further investments fund the best regionally significant projects to meet air quality goals and requirements. This process, which has been ongoing, included public outreach and air quality goal-setting, and the evaluation of the original and alternative SIP projects. DEP has proposed SIP revisions

and submitted them to the U.S. Department of Environmental Protection (USEPA). These revisions include a commitment to complete the final design of the Red Line/Blue Line Connector by the end of 2011. The SIP revisions are now being reviewed by USEPA.

This EENF proposes a project that is consistent with both the original and revised SIP CA/T transit commitments.

B. Describe measures that the proponent will take to comply with other federal, state, regional, and local plans and policies related to air resources and air quality:

SOLID AND HAZARDOUS WASTE SECTION

I. Thresholds / Permits

A. Will the project meet or exceed any review thresholds related to **solid or hazardous waste** (see 301 CMR 11.03(9))? ___ Yes X No; if yes, specify, in quantitative terms:

B. Does the project require any state permits related to **solid and hazardous waste**? ___Yes X No; if yes, specify which permit:

C. If you answered "No" to both questions A and B, proceed to the **Historical and Archaeological Resources Section**. If you answered "Yes" to either question A or question B, fill out the remainder of the Solid and Hazardous Waste Section below.

II. Impacts and Permits

A. Is there any current or proposed facility at the project site for the storage, treatment, processing, combustion or disposal of solid waste? ___ Yes ___ No; if yes, what is the volume (in tons per day) of the capacity:

	Existing	Change	Total
Storage	_____	_____	_____
Treatment, processing	_____	_____	_____
Combustion	_____	_____	_____
Disposal	_____	_____	_____

B. Is there any current or proposed facility at the project site for the storage, recycling, treatment or disposal of hazardous waste? ___ Yes ___ No; if yes, what is the volume (in tons or gallons per day) of the capacity:

	Existing	Change	Total
Storage	_____	_____	_____
Recycling	_____	_____	_____
Treatment	_____	_____	_____
Disposal	_____	_____	_____

C. If the project will generate solid waste (for example, during demolition or construction), describe alternatives considered for re-use, recycling, and disposal:

D. If the project involves demolition, do any buildings to be demolished contain asbestos? ___ Yes ___ No

E. Describe the project's other solid and hazardous waste impacts (including indirect impacts):

III. Consistency--Describe measures that the proponent will take to comply with the State Solid Waste Master Plan:

HISTORICAL AND ARCHAEOLOGICAL RESOURCES SECTION

I. Thresholds / Impacts

A. Is any part of the project site a historic structure, or a structure within a historic district, in either case listed in the State Register of Historic Places or the Inventory of Historic and Archaeological Assets of the Commonwealth? __X__ Yes ___ No; if yes, does the project involve the demolition of all or any exterior part of such historic structure? ___ Yes __X__ No; if yes, please describe:

A review of MassGIS files revealed that the project area along Cambridge Street lies adjacent to the Beacon Hill Historic District as designated in the State and National Registers of Historic Places. The Beacon Hill Historic District was originated in 1955 by act of the MA General Court, Chapter 616, of the Acts of 1955, as Amended, to "promote the educational, cultural, economic, and general welfare of the public through the preservation of the historic Beacon Hill district, and to maintain said district as a landmark in the history of architecture and as a tangible reminder of old Boston as it existed in the early days of the commonwealth." The exact boundaries of the District are unclear but will be ascertained during the development of the SEIR. The project area also lies close to the Charles River Basin Historic District which is designated in the National Register of Historic Places. The Charles River Basin Historic District was created in the early 20th-century from tidal marshes and mud flats. The Charles River Basin was designed to provide city dwellers access to outstanding river scenery and recreational opportunities on both water and land.

Further review of MassGIS files revealed that two sites immediately adjacent to the project on Cambridge Street are listed on the State Register of Historic Places and the National Register of Historic Places - the Old West Church/ West End Church and the Harrison Gray Otis House. There are also six additional historic sites listed in the state register within one block of the corridor. Each of these structures is described below. No alterations to any of these structures are anticipated.

Old West Church/ West End Church: 131 Cambridge Street. An active United Methodist parish. Built in 1737, then disbanded in 1887 due to changing neighborhood demographics, and opened again as the West End Library from 1894 until 1962. During the time of the Revolution, the Church occupied one of the highest spots in the city, causing the British to destroy the church tower to prevent lighted beacons from being hung as signals to those on the other side of the Charles River.

(First) Harrison Gray Otis House: 141 Cambridge Street. The first home of Harrison Gray Otis, a land developer, lawyer, Congressman, and Boston mayor, it now serves as a museum to the Otis family. The museum is a historical restoration of wallpapers, carpeting and furnishing. This sight is also the headquarters of Historic New England, its Library and Archives, and a museum shop with books, reproductions and gifts. School programs and historic Beacon Hill walking tours are also based out of the museum.

Boston Police Station #3/ Hill House: 74 Joy Street. Built in 1862, the city turned the building over to the Beacon Hill Civic Association in the 1960s to house its offices, give the Beacon Hill Nursery School a permanent home and for use as a community center. The civic association created Hill House, Inc. that now owns and oversees the building, and sponsors activities for youth there.

Peter Faneuil School: 30 South Russell Street. Converted to a 40-unit apartment building for low-income individuals and families; currently managed by Rogerson Communities.

William C. Nell Residence/ Thomas P. and James Taylor Scott House: 3 Smith Court. From the 1830s to the end of the Civil War, Nell was a leading African-American abolitionist and spokesman for civil rights. In 1855, Nell published the first history of African Americans written by an African American, entitled "The Colored Patriots of the American Revolution."

African Meeting House/ First African Baptist Church- Abolition Church: 8 Smith Court. Home to the Museum of African American History in Boston, also an event center and music venue. Oldest African Meeting House in the country and the last stop on the Museum of African American History Black Heritage Trail. Also the first black church built in Boston. Building where in 1863 Frederick Douglas gathered troops for the 54th and 55th Massachusetts Volunteer Infantry, the first all black regiment to serve in the Civil War. Currently being restored to its 1855 condition.

Suffolk County Jail/ Charles Street Jail: 215 Charles Street. Designed by Gridley J. F. Bryant in the Boston Granite School style, Bryant collaborated with the Reverend Louis Dwight, founder of the Prison Discipline Society of Boston, to incorporate the most advanced theories of the prison reform movement into his design. As a result of its design and espousal of humanitarian ideals, the jail was the first American building to be featured in The Builder, the most influential British architectural journal of the time. The jail was closed in 1990 and is now being converted into a luxury hotel.

Lewis and Harriet Hayden House: 66 Phillips Street. Constructed in 1833, its significance relates to the Greek Revival architectural style. This property was identified in the MACRIS database as a Local Historic District, National Historical Landmark, National Register District, and Preservation Restriction, though further searches in federal databases returned no results.

In addition to those locations listed on the National and State registries, the National Park Service has designated some historically significant areas on Beacon Hill as the Boston African American National Historic Sites. While three of these sites also appear on national or state registries, the majority do not. Those sites that do not appear on any official registries are also not part of the MassGIS database and therefore required further research. The majority of these sites are currently private residences. The five sites listed below are within two blocks of the project site.

Abiel Smith School: 46 Joy Street. Current information from the National Park Service web site also lists this site as a National Historic Landmark, although no information can be found on the NRIS database.
Smith Court Residences: 2, 3, 4, 5, 7, 7a Smith Court. Private residences closed to the public.
John Coburn House: 2 Phillips Street. Private residence, closed to the public.
Lewis and Harriet Hayden House: Identified above as part of the National and State registries.
African Meeting House: Identified above as part of the National and State registries.

Also part of the Boston African American National Historic Site registry, though not as close to the project site, are the following: George Middleton House, Phillips School, John J. Smith House, and the Charles Street Meeting House.

Previous studies of the project also identified the Physician's House, located at the intersection of North Grove and Cambridge Streets as a Historic Resource, although further research could not verify this information. The Physicians House was not listed in the MassGIS database, the 2005 State Register of Historic Places (most current available), or the NRIS database.

Previous studies of the project inventoried all other buildings on Cambridge Street and concluded that none of the inventoried buildings retained a necessary level of integrity to constitute a significant structure by Federal, State, or local criteria:

B. Is any part of the project site an archaeological site listed in the State Register of Historic Places or the Inventory of Historic and Archaeological Assets of the Commonwealth? ___ Yes __**X**__ No; If yes, does the project involve the destruction of all or any part of such archaeological site? ___ Yes ____No; if yes, please describe:

Data on Archaeological Resources in the Commonwealth are currently unavailable to the public. However, previous project studies noted that while the potential for archaeological resources in the immediate study area does exist, it is unlikely that those resources have remained intact through periods of wharfing out, dredging, filling, and construction of pile supported buildings. The same studies note that three areas near the project site could potentially contain archaeological assets, although it is not currently envisioned that these sites will be disturbed.

The lots east and west of Lindall Place: These lots were part of 17th century wharves along the shoreline and later occupied by Boston's 19th century Afro-American community. Though earlier buildings were altered, newer structures have not been built on the site.

Park on the North side of Cambridge Street: between North Anderson and Blossom Streets: May contain resources related to the early West Boston and Afro-American communities, though the use of this site for a gas station may have compromised the resources.

The African Meeting House and the Wilkensen Back Lot: These sites have shown that the alley and yard areas have a significant potential for archaeological resources.

C. If you answered "No" to all parts of both questions A and B, proceed to the Attachments and Certifications Sections. If you answered "Yes" to any part of either question A or question B, fill out the remainder of the Historical and Archaeological Resources Section below.

D. Have you consulted with the Massachusetts Historical Commission? ___ Yes __**X**__ No; if yes, attach correspondence

E. Describe and assess the project's other impacts, direct and indirect, on listed or inventoried historical and archaeological resources:

The proposed project will result in some noise and vibration impacts, both during and after construction. Cut and cover construction methods will result in noise and vibration impacts on the surrounding historic district. The completed project will be entirely underground; however, noise from passing trains could reach the street through station entrances and ventilation shafts. Vibration from passing trains may be felt on the street and in surrounding structures. More detail on the noise and vibration impacts of the proposed project on the historic district and on historic structures will be determined during subsequent stages of the environmental review process.

The proposed project will result in some impacts on groundwater, both during and after construction. Groundwater monitoring and mitigation will be a required component of the project to minimize impacts to adjacent historic structure foundations due to change in ground water levels from de-watering.

II. Consistency -- Describe measures that the proponent will take to comply with federal, state, regional, and local plans and policies related to preserving historical and archaeological resources:

EOT will provide field survey, research, analysis, and documentation services in order to comply with the appropriate federal and state regulations concerning the protection of historic and/or archeological resources. Applicable laws and regulations may include: the National Historic Preservation Act of 1966 (PL 89-665, 16 USC 470), as amended by Ch. 254, Acts of 1988.

ATTACHMENTS:

1. Plan, at an appropriate scale, of existing conditions of the project site and its immediate context, showing all known structures, roadways and parking lots, rail rights-of-way, wetlands and water bodies, wooded areas, farmland, steep slopes, public open spaces, and major utilities.

2. Plan of proposed conditions upon completion of project (if construction of the project is proposed to be phased, there should be a site plan showing conditions upon the completion of each phase).

3. Original U.S.G.S. map or good quality color copy (8-½ x 11 inches or larger) indicating the project location and boundaries

4. List of all agencies and persons to whom the proponent circulated the EENF, in accordance with 301 CMR 11.16(2).

5.1 Bowdoin/Charles Connector Project, Preliminary Design and Environmental Study, Status Report, November 1987, Executive Summary

5.2 Excerpt from 2003 MBTA Program for Mass Transportation

5.3 Memorandum concerning operation of revenue service on the Bowdoin Station loop

5.4 Supplemental Information Developed for this EENF

CERTIFICATIONS:

The Public Notice of Environmental Review has been/will be published in the following newspapers in accordance with 301 CMR 11.15(1):

(Name)	(Date)
Boston Herald	On or before September 25, 2007
Boston Globe	On or before September 25, 2007
The Boston Courant	On or before September 25, 2007
East Boston Times Free-Press	On or before September 25, 2007
North End Regional Review	On or before September 25, 2007
Revere Journal	On or before September 25, 2007
Winthrop Sun Transcript	On or before September 25, 2007
Chelsea Record	On or before September 25, 2007
Cambridge Chronicle	On or before September 25, 2007
Somerville Journal	On or before September 25, 2007
La Semana	On or before September 25, 2007
El Mundo	On or before September 25, 2007

2. This form has been circulated to Agencies and Persons in accordance with 301 CMR 11.16(2).

09/06/07 Date — Signature of Responsible Officer Or Proponent

Name : **David Mohler**
Acting Deputy Secretary, Executive Office of Transportation
Acting Executive Director, Office of Transportation Planning

Firm/Agency: Executive Office of Transportation

Street: Ten Park Plaza, Room 4150

Municipality/State/Zip: Boston, MA 02116

Phone: 617-973-8064

9/6/07 Date — Signature of person preparing EENF (if different from above)

Name: James A. Wensley

Firm/Agency: TranSystems Corporation

Street: One Cabot Road

Municipality/State/Zip: Medford, MA 02155

Phone: 781-396-7775

Attachment 1

Existing Conditions

Aerial Photo of Project Area

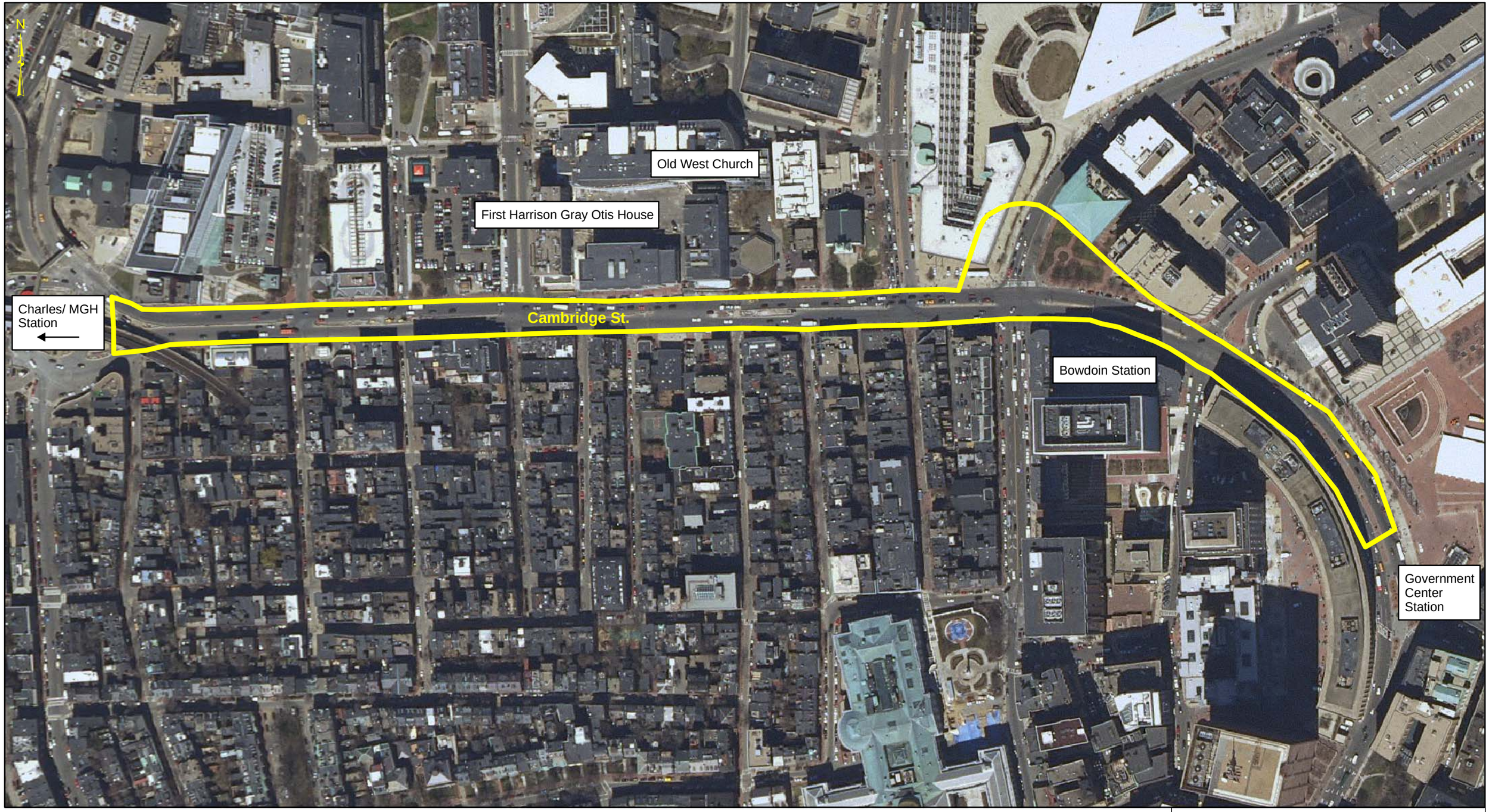
Source: Mass GIS

Cambridge Street Traffic Volumes

Source: Institutional Master Plan – Massachusetts General Hospital; Transportation Access Plan; Vanasse Hangen Brustlin, Inc.; August 11, 2006.

Existing Blue Line Tunnels

Source: Seelye Stevenson Value & Knecht, Bowdoin Station & Charles Station Connector Project, Feasibility Study and Final Report, December 1986.



Red Line/ Blue Line Connector

Project Area

1 inch equals 200 feet

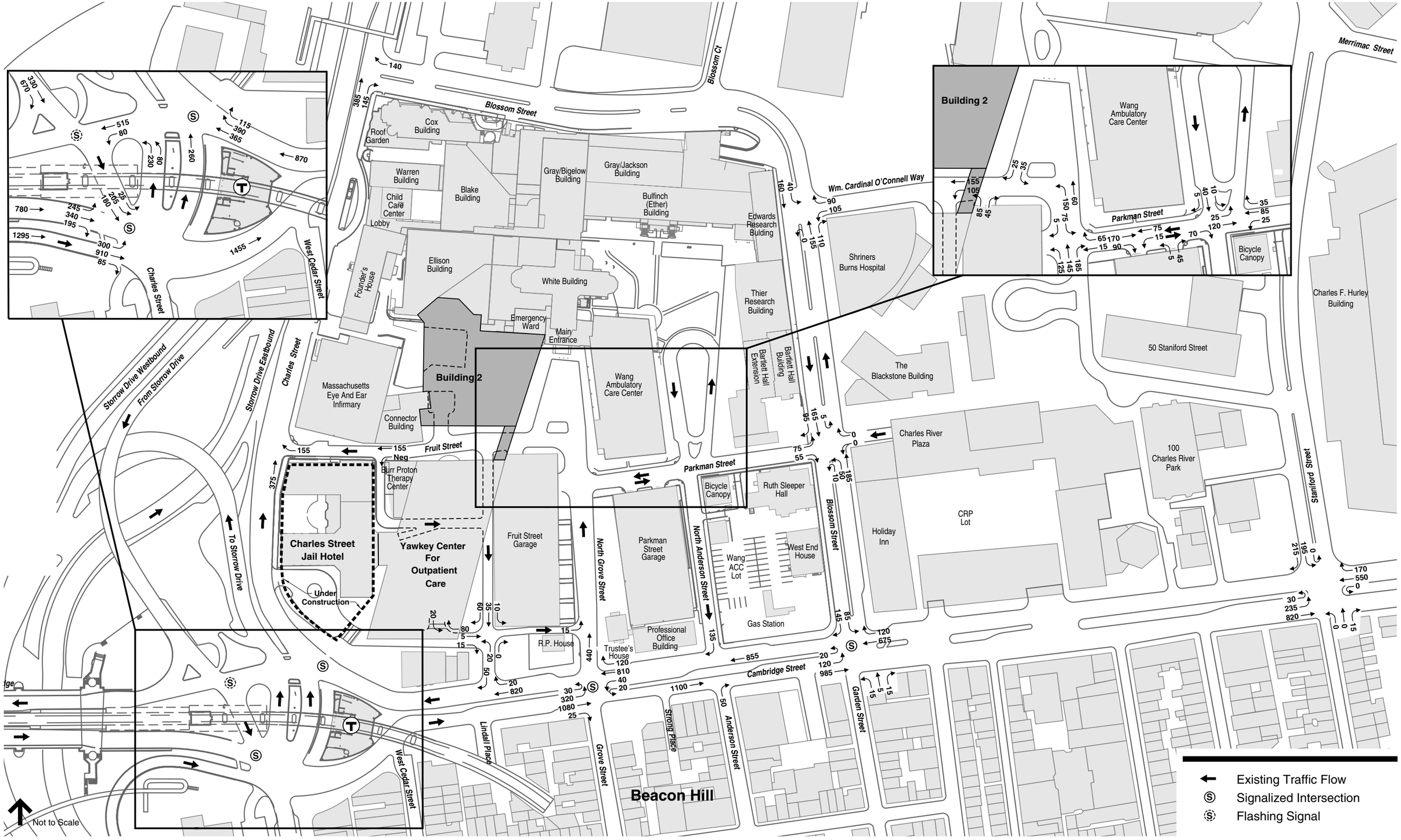
0 0.05 0.1 0.2 0.3 0.4 0.5 Miles

RED LINE/ BLUE LINE CONNECTOR EXISTING CONDITIONS

PREPARED FOR EOT

PREPARED BY TranSystems

Data Source: MassGIS



Note: Minor imbalances between intersections are caused by driveways, on-street parking, and loading activity.

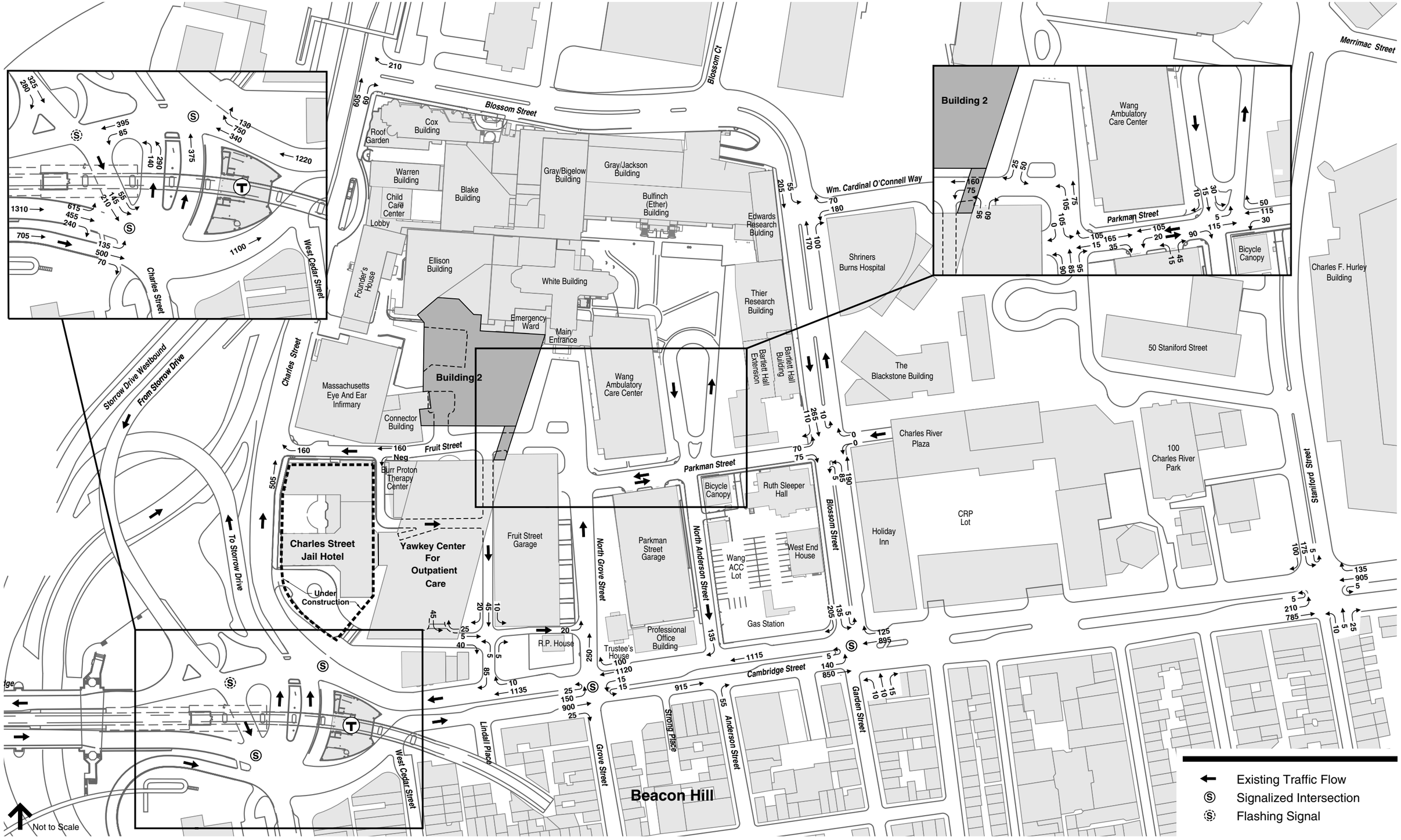
Vanasse Hangen Brustlin, Inc.

ts.07903\graphics\figures\June2006\net-exam.dwg

Massachusetts General Hospital
Institutional Master Plan

2005 Existing Conditions Morning Peak Hour Traffic Volumes (8:00 AM to 9:00 AM)

Figure 5-19



Note: Minor imbalances between intersections are caused by driveways, on-street parking, and loading activity.

Vanasse Hangen Brustlin, Inc.

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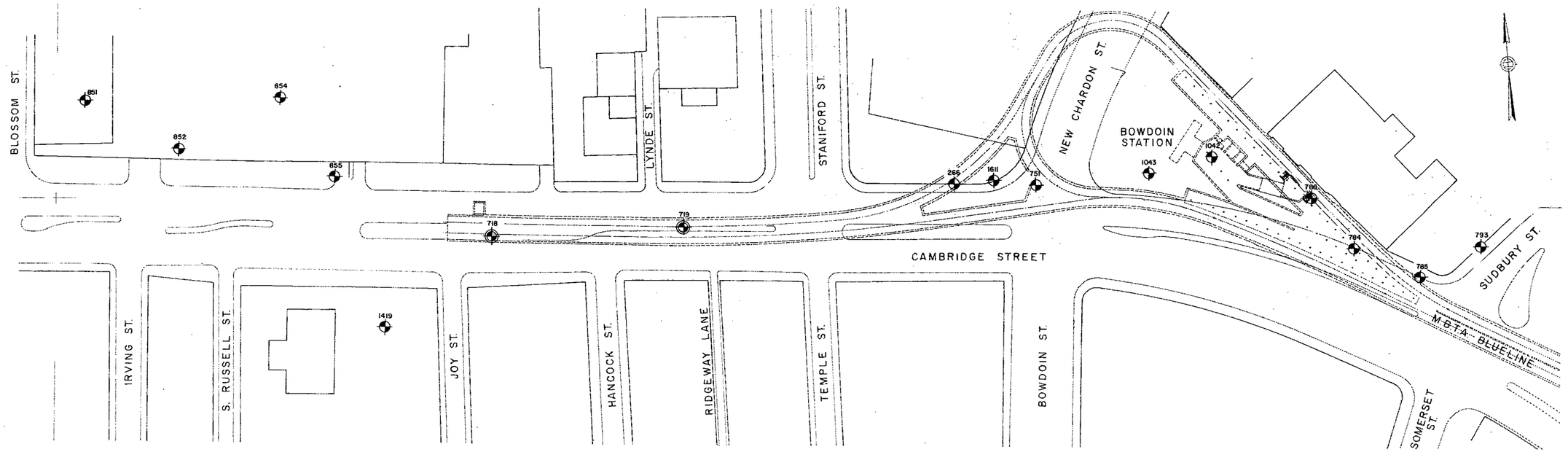
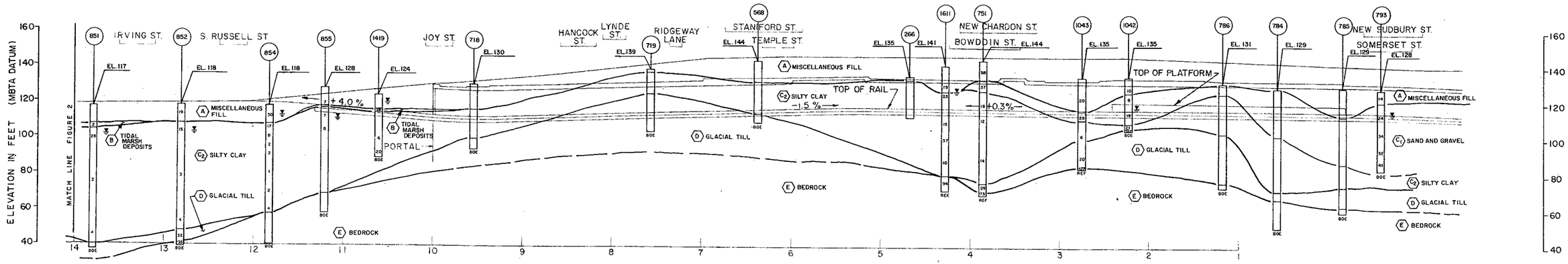
Massachusetts General Hospital
Institutional Master Plan

2005 Existing Conditions Evening Peak Hour Traffic Volumes (5:00 PM to 6:00 PM)
Figure 5-20



PLAN

SCALE IN FEET



PROFILE

HORIZONTAL SCALE IN FEET

VERTICAL SCALE IN FEET

FOR LEGEND AND NOTES SEE FIGURE 3

Bowdoin Station–Charles St. Station Connector Project–Feasibility Study

EXISTING CONDITIONS–BOWDOIN STATION TO BLOSSOM STREET AVAILABLE SUBSURFACE INFORMATION

HALEY & ALDRICH, INC. CAMBRIDGE, MASSACHUSETTS
CONSULTING GEOTECHNICAL ENGINEERS, GEOLOGISTS AND HYDROGEOLOGISTS

STV/Seelye Stevenson Value & Knecht
Engineers and Planners

FIGURE 3

Attachment 2

Project Plan and Description

Project Plan and Description

Project Purpose

The Red Line/Blue Line Connector Project is an initiative of the Executive Office of Transportation (EOT) and the Massachusetts Bay Transportation Authority (MBTA) to implement enhancements to transit services that will improve mobility and regional access for the residents of East Boston and North Shore communities and the residents of Cambridge and the northwestern suburbs. The project will also enhance access to Massachusetts General Hospital and the surrounding medical facilities from East Boston, Revere, and the North Shore. The project is located along Cambridge Street in Boston. The location is shown in Attachment 3. The Red Line and Blue Line are the only two of Boston's rapid transit lines that do not intersect. Current transit riders traveling between points on the Blue Line along the Boston waterfront, in East Boston, and in Revere, and points on the Red Line in Cambridge, Somerville and the south shore, must transfer to the Green or Orange Lines for one stop in order to complete their trip. A direct connection between these two lines will boost transit ridership, reduce automobile travel through the downtown, improve air quality, reduce congestion in the existing downtown transfer stations, and improve mobility and access to jobs and health care for residents of East Boston, Revere, Winthrop, and Chelsea.

Project History and Current Conditions

When Bowdoin and Scollay Square (now Government Center) Stations were constructed in 1916, streetcars from East Boston traveled under the harbor from East Boston and served the stations before surfacing in Cambridge Street, west of Joy Street, and continuing on over the Longfellow Bridge to Cambridge. When the streetcars in the tunnel were replaced by rapid transit cars in 1924, the connection between East Boston and Cambridge was broken and the loop track at Bowdoin Station became the end of the line. For years the Cambridge Street portal remained open for rapid transit cars to access the Eliot yards in Cambridge, but it was closed in 1952 after the line was extended to the Orient Heights yard in East Boston. The portal was filled and sealed leaving a dead end tail track extending off the loop track at Bowdoin Station. Currently all Blue Line trains use the loop track to reverse direction and begin their outbound trip. (Train operators do not need to switch ends of the train to begin the outbound trip.) The size of the loop limits the length of the center platforms so that six car trains can only be accommodated on the westbound platform. The tail track is used for storage of trains. The configuration of the existing tunnels was shown in Attachment 1.

The proposed connector, originally called the Bowdoin-Charles Connector, was the subject of a feasibility study in 1986[1] and a subsequent Preliminary Design and Environmental Study. The Preliminary Design and Environmental Study was halted after a decision by the MBTA to seek federal funding for the project, and a status report was produced summarizing the work completed as of June 1987[2]. (Studies to support the federal funding process were never begun.) The two completed studies examined the extension of the Blue Line from the end of the existing tail track tunnel, near Joy Street, under Cambridge Street to Charles/MGH Station, where a new underground platform would be built with pedestrian connections to the elevated Red Line platforms. The design as it stood in 1987 is shown in Figures 1 and 2. While no further

1 STV/Seelye Stevenson Value & Knecht, *Bowdoin Station & Charles Station Connector Project, Feasibility Study and Final Report*, December 1986.

2 Howard Needles Tammen & Bergendoff / Thomas K. Dyer Inc., *Bowdoin / Charles Connector Project, Preliminary Design and Environmental Studies, Status Report*, November 1987.

environmental or engineering studies have been done, the project has been included in regional transportation plans (most recently the 2007 plan "Journey to 2030"[3]) and the 2003 Program for Mass Transportation (PMT). The 2006 amendments to the State Implementation Plan (SIP), and resulting transit regulations[4], require that Final Design for the connector be completed by the end of 2011. These regulations now define the project as beginning further east at Government Center Station, rather than at Bowdoin Station.

Since the earlier environmental and engineering studies were produced, several related projects have been completed or designed. Cambridge Street, under which the project would be located, is currently being reconstructed, resulting in a modified traffic and parking configuration, as well as the relocation of existing utilities and the installation of additional utilities. The Charles/MGH Red Line Station was renovated and a new street-level headhouse was constructed on an island in the center of Cambridge Street, replacing the elevated headhouse and pedestrian bridges that once provided access to the station. This street-level entrance and fare collection lobby was designed to also serve as a Blue Line entrance and is located where the Bowdoin-Charles Connector studies proposed an underground fare collection lobby to be accessed by pedestrian tunnels under Cambridge Street. The new street-level lobby was constructed so that a lower level could be constructed beneath it and the elevator shafts could be extended to the lower level to allow access to a Blue Line Station underneath. Finally, enhancements to Government Center Station have been designed, including a reconstructed City Hall Plaza entrance, an additional Blue Line entrance closer to the JFK Building and Bowdoin Station, and the closure of Bowdoin Station. However, these plans are in the process of being revised, possibly eliminating the additional entrance and keeping Bowdoin Station open.

As part of an examination of options for providing Blue Line service at Bowdoin Station with 6-car trains, the MBTA recently tested whether it could safely operate trains through the Bowdoin Loop with passengers on board. The test is documented in Attachment 5.3. The MBTA concluded that passengers cannot be evacuated from a train stopped on the loop in an emergency. The radius of the loop causes wide gaps between cars and causes the doors between cars to be partially blocked preventing the transfer of a stretcher between cars. There would also be difficulties safely securing emergency ladders on both end and side doors. Because a train stopped on the loop cannot be safely evacuated, the MBTA cannot permit passengers to travel around the loop. Therefore the tight turning radius of the loop track will need to be eliminated through the re-alignment of the westbound track if this track is to be extended as part of the Red Line/Blue Line Connector. This necessitates an expansion of the project limits as examined in the prior studies and will result in a more complex and costly project than previously anticipated.

Project Limits

The location of the proposed Red Line/Blue Line Connector Project is shown in Figure 3. The project consists of the extension of the MBTA's Blue Line under Cambridge Street to Charles/MGH Station. The eastern limit of the project is defined as Government Center Station. The eastern limit of construction is likely to be the eastern end of Bowdoin Station. The western limit of the project includes the new Charles/MGH Station headhouse. The project consists of three major components: 1) the realignment of

3 Boston Region Metropolitan Planning Organization, *Journey to 2030: Transportation Plan of the Boston Region Metropolitan Planning Organization*, April 2007

4 310 CMR 7.36(2)(i)

the westbound Blue Line track through Bowdoin Station including the widening of the existing tunnel and the closure of the existing Bowdoin station, 2) a new 1,400' rapid transit tunnel extending the Blue Line under Cambridge Street, and 3) a new underground Blue Line Station connected to the existing Charles/MGH Station headhouse. It may also include the construction of a new Bowdoin Station accompanied by additional modifications to existing tunnels. The exact configurations of both the new Charles/MGH platform and potential new Bowdoin Station have not been determined. The entire project, with the exception of parts of Bowdoin Station, lies within the right-of-way of Cambridge Street. Cambridge Street is under the jurisdiction of the City of Boston. The westernmost end of the project area, Charles Circle, is under the jurisdiction of the Department of Conservation and Recreation (DCR).

Bowdoin Station Track Alignment, Tunnels, and Platforms

The need to eliminate the Bowdoin Loop impacts the MBTA's ability to keep Bowdoin Station open. It does not appear possible to avoid impacting the station by re-aligning only the section of the westbound tunnel west of the station, as the Hurley building and the Harrison Gary Otis House lie in the area through which such a larger radius curve would need to be constructed (see the diagram of existing tunnels in Attachment 1). The only alternative appears to be to close the existing Bowdoin Station and to re-align the westbound track through the existing station center platform, such that it remains parallel to the eastbound track. Bowdoin station would either be completely eliminated or would need to be reconstructed with new side platforms alongside the existing eastbound and re-aligned westbound track. The horizontal and vertical curvature of the track alignment through this area, however, may preclude the construction of new platforms without further re-alignment of both tracks and a resulting further reconstruction of the tunnels. Therefore, modifications to the track alignment and tunnels through Bowdoin Station and the creation of possible new station platforms and entrances will be evaluated as part of the SEIR. The SEIR will examine one alternative with a new Bowdoin Station and one with no Bowdoin Station.

Extended Blue Line Tunnel, Track Alignment, and Systems

Like the existing Blue Line tunnel, the tunnel extension would be close to the street. The early engineering studies placed the top of rail between 27' and 35' below street level. The studies noted that this vertical alignment would extend between 10' and 20' below existing groundwater levels. In the existing tail track section between Bowdoin Station and Joy Street, where streetcars once surfaced, the tunnel invert will need to be lowered by up to 10'.

The horizontal center of the tunnel is proposed to lie near the center of Cambridge Street. The tunnel width is expected to be approximately 30' at the eastern end where it would meet the existing tunnel, expanding to as much as 55' west of Garden Street where additional storage tracks would be included. At the new Blue Line platform at the western end of the project, the tunnel is expected to vary between 50' and 60' wide. The alternatives considered in the feasibility study ended the tunnel just before encountering the piers supporting the Red Line. The conceptual design developed for the engineering study moved the tracks and platform to pass directly under three Red Line support piers. This would require the underpinning of at least these three piers. The location of the end of the tunnel in relationship to the Red Line piers and station will be determined during development of the SEIR.

The tunnel will contain at least two tracks throughout its length. Additional storage tracks were recommended by both the feasibility and the engineering studies. The exact configuration will be determined in the SEIR and could result in some sections of the tunnel having as many as four tracks.

Third rail traction power systems will be required throughout the tunnel. Studies will be needed to determine whether a new substation is required. Signals, communications, and AC electrical systems will also be necessary within the tunnel. Ventilation will be required in the tunnel. The engineering studies proposed a vent shaft and emergency exit near the eastern end of the new station at the corner of Grove Street. This opening is expected to be the only tunnel element visible from the street when the project is completed.

Because the proposed tunnel invert extends below both existing groundwater levels and existing storm drains, a drainage pit and pumps will be necessary to remove seepage and any stormwater that enters through the stations or vent shaft. Storm water drainage systems will need to be designed according to DEP regulations, considering best management practices. The tunnel may also need to include drains or troughs to permit the flow of groundwater across the tunnel in areas where the tunnel roof would be above the groundwater table.

Charles/MGH Station

One new Blue Line station is proposed under Cambridge Street with an entrance inside the existing Red Line Charles/MGH Station headhouse. New construction would include extensions of the existing elevator shafts to the Blue Line level, a passageway from the elevators to the Blue Line platforms under the existing headhouse floor, a stairway and escalator from the existing street-level headhouse down to the Blue Line platform level, and a single 320' long center platform in the tunnel. There would be two stub end tracks extending to the western end of the tunnel and station. These may end before reaching the columns that support the Red line elevated structure, or underpinning of one or more columns may be required.

The existing Red Line elevator shafts would be extended downward to the Blue Line level. Access from the elevators to the platforms would be beneath the existing headhouse. The headhouse floor is a single structural slab capable of spanning a future lower level lobby. The stairways/escalators would require an eastward extension of the exterior of the headhouse and the reconfiguration or relocation of the "event entrance" to the headhouse. This extension would be the only new station elements visible from the street. There will be no new parking facilities, facilities for passenger drop-off and pick-up, or bus stops. Below ground, the station would include a starter's room, possible police sub-station, and areas for communications, signal, elevator, electrical, and mechanical equipment. No additional station staff is expected since fares will be paid at the existing fare gates in Charles/MGH Station.

Blue Line Operations

All Blue Line service will use the new Charles/MGH Station as the southern/western terminus. The 1986 feasibility study estimated that the extension would add five minutes to the total round trip time on the Blue Line. This includes time for operators to switch ends of the train (which is not now required at the Bowdoin loop). With peak period Blue Line service operating every three minutes, the extension is expected to require two additional peak period trains in service in order to maintain headways. At other times, one additional train would be required. Operation of these additional trains will increase Blue Line operating costs.

Ridership
The project will expand transit facilities and increase transit usage in the study area. Prior studies have estimated ridership on the connector at between 3,800 and 9,000 weekday riders[5]. While many of these riders would be existing transit users who would benefit from a shorter trip involving fewer transfers, the project is expected to result in an increase in transit trips in comparison to the No Build Alternative. The 2003 Program for Mass Transportation estimated that 2,800 new daily transit trips would be generated by the project. Subsequent refinements of the ridership estimates done for the MBTA in 2005 estimated that 3,100 new daily transit trips would be generated; of these 1,700 are expected to be walk trips diverted to transit, while an estimated 1,400 daily person trips would be diverted from automobiles.

Coordination with Other Transportation Projects in Planning or Under Design
The project is consistent with numerous transportation and land use plans as outlined in the appropriate sections of the EENF. As the project is developed, there will be a need for close coordination with several ongoing transportation projects. These include:

- Storrow Drive Tunnel Reconstruction
- Longfellow Bridge Reconstruction
- Silver Line Phase III
- Green Line Extension to Somerville and Medford

Possible Impacts Upon Completion
In addition to improving mobility for transit users in the Blue Line and Red Line corridors, the proposed project would reduce automobile travel, improve air quality, and improve the efficiency of the regional rapid transit system through the elimination of transfers at subway stations in the central area. The number of transfers at Park Street, Government Center, Downtown Crossing and State is expected to decrease and the volume of Green, Orange, and Red Line passengers between these stations would be reduced. These changes will further reduce congestion in the downtown transit core.

While the proposed project will have an overall positive environmental impact through reduced automobile travel and improved air quality, there could be localized impacts on the nearby community. The proposed project area lies adjacent to the Beacon Hill Historic District and close to the Charles River Basin Historical District. Immediately adjacent to the project on Cambridge Street there are two sites that are listed on the State Register of Historic Places and the National Register of Historic Places - the Old West Church/ West End Church and the Harrison Gray Otis House. There are also six additional historic sites within one block of the corridor.

The proposed project will result in some noise and vibration impacts, both during and after construction. The completed project will be entirely underground; however, noise from passing trains could reach the street through station entrances and ventilation shafts. Vibration from passing trains may be felt on the street and in surrounding structures. Tunnel construction will result in noise and vibration impacts on the surrounding area. Construction impacts are discussed below.

5 Estimates were done as long ago as 1986 and as recently as 2005. Some estimates looked at then existing (base year) ridership only while others examined various future years. The land use assumptions and assumptions regarding the completion of other proposed transit improvements also varied among the estimates.

Possible Construction Impacts

A four year construction schedule is anticipated. Although deep bore tunneling methods have not been ruled out, the proximity of the existing Blue Line tunnel to the surface, the topography of the project area, and the sub-surface conditions led the prior studies to recommend that cut-and-cover tunneling methods be used from Joy Street to Charles/MGH Station. This would result in temporary construction impacts throughout this area. These impacts may include traffic detours, reductions in roadway capacity, restricted deliveries, and reduced parking, as well as groundwater, soil disposal, noise, vibration, utility relocation, and pest control issues.

Temporary excavation supports will be required for cut-and cover construction of the tunnel extension to retain soil and minimize impact to adjacent structures, streets, sidewalks, and utilities. The type of support has not been determined. The 1987 engineering study examined steel sheeting (which is easier to work around existing utilities) and slurry walls (which allow less infiltration of groundwater), with a preliminary recommendation that slurry walls be used for most of the project. In addition, construction methods in which the tunnel roof is constructed prior to excavation can reduce surface disruption while slightly increasing the length of the construction period.

Between Bowdoin Station and Joy Street, the lowering of the tunnel floor is expected to be accomplished through temporary supports from inside the tunnel. As a result, construction in this segment is expected to occur without significant surface disruption. The closure of the tail track, however, would impact the ability of the MBTA to store Blue Line trains downtown. In the vicinity of Bowdoin Station, the extent of construction activity will depend on the extent of reconstruction of the station.

In order to minimize or eliminate impacts on adjacent structures, efforts will be made to limit the disturbance of groundwater levels during construction of the proposed tunnel extension. Monitoring of groundwater levels will be conducted prior to construction to ascertain the subsurface water level, as groundwater levels tend to fluctuate naturally throughout the year. The SEIR will consider and evaluate construction methods which avoid or minimize the disturbance of groundwater levels adjacent to the site and will identify measures necessary to avoid or mitigate any impacts on surrounding structures. Further monitoring of groundwater levels during construction will enable the control of groundwater levels in the area adjacent to construction site through discharge of excess water or recharge of groundwater using water removed from the construction site.

Within the construction site, dewatering by means of pumping will be required to excavate the tunnel and construct the tunnel structure and tracks. Pumped water can either be discharged from the construction area or be used, as necessary, to recharge the groundwater table in the adjacent area outside the excavation support. Such recharge would require injection points along the excavation to enable pumping of water to the sides of the work area and into wells on the opposite side of the excavation support system. The 1987 engineering study found high chloride levels in groundwater at the site, but did not find elevated levels of metals, oil, or grease. Low levels of petroleum hydrocarbons were detected in isolated shallow wells. As noted above, the type of excavation support for the proposed tunnel extension will have an impact on the amount of groundwater infiltration in the excavated area. The type of excavation support and methods for dewatering will be evaluated during the SEIR process with the intent of minimizing groundwater disturbance.

The groundwater monitoring program developed as part of the SEIR will also include design to maintain the existing groundwater level after completion of the tunnel and analysis of adjacent structures for the final anticipated groundwater level to assure that any water level change will not impact the adjacent structure foundations.

The 1987 engineering study identified that approximately 103,600 cubic yards of soil would be excavated between Bowdoin and Charles/MGH Stations (more excavation would be required if modifications are made to Bowdoin Station). Approximately 2/3 of the excavated soil would be silty clay and 1/3 miscellaneous fill. The fill is also expected to contain granite blocks, timbers, and other buried obstructions from structures present prior to the construction and expansion of Cambridge Street, as well contaminated soils. This soil and other materials will need to be disposed of off-site. The study indicated "a discontinuous distribution of various contaminants in the soil, particularly the fill. Specifically, petroleum hydrocarbons (PHC's), polycyclic aromatic hydrocarbons (PAH's), lead, 3,3'-dichlorobenzidine, and oil and grease are of potential concern. The contamination pattern, however, does not suggest a single concentrated source for most of the contaminants."[6] This will require on-site testing of soil prior to disposal.

Vibration due to construction is also a factor to be considered and mitigation measures should be taken to prevent damage to adjacent structures, both cosmetic and structural. Buildings abutting the proposed project may require underpinning to reduce potential movements and settlement. One or more of the piers supporting the Red Line viaduct may require underpinning. A monitoring program to measure structure settlements and ground movements and strains that translate into vertical and horizontal movement of the ground adjacent to the excavation should be implemented to control and minimize potential impacts to all structures and properties within the anticipated vibration envelope.

Cambridge Street has an extensive network of utilities both parallel to and crossing the tunnel alignment. There are electric, steam, telephone (including fiber optic), water, gas, and sewer lines in the project area. While these existing utilities would need to be supported or temporarily relocated during construction, most could be replaced in the space above the tunnel when construction is completed. Alternatively, some could be permanently relocated parallel to the new tunnel just prior to tunnel construction. An existing 36" x 51" sewer line running under Cambridge Street would need to be permanently relocated within the Cambridge Street right-of-way to make room for the tunnel. The SEIR will develop a current inventory of all affected utilities, identify the owners of each affected component, and outline a plan to maintain continuous service during construction.

Maintenance of vehicular access throughout the project area will be a major concern. The flow of emergency vehicles to Massachusetts General Hospital will need to be maintained. Police and fire access to Beacon Hill must be preserved, as well as access to/from the Boston Fire Department station on Cambridge Street. Vehicular traffic will need to be discouraged from traversing the residential Beacon Hill neighborhood to avoid the construction site. Pedestrian traffic will also need to be maintained and protected throughout the construction period. Access to Cambridge Street businesses will also need to be

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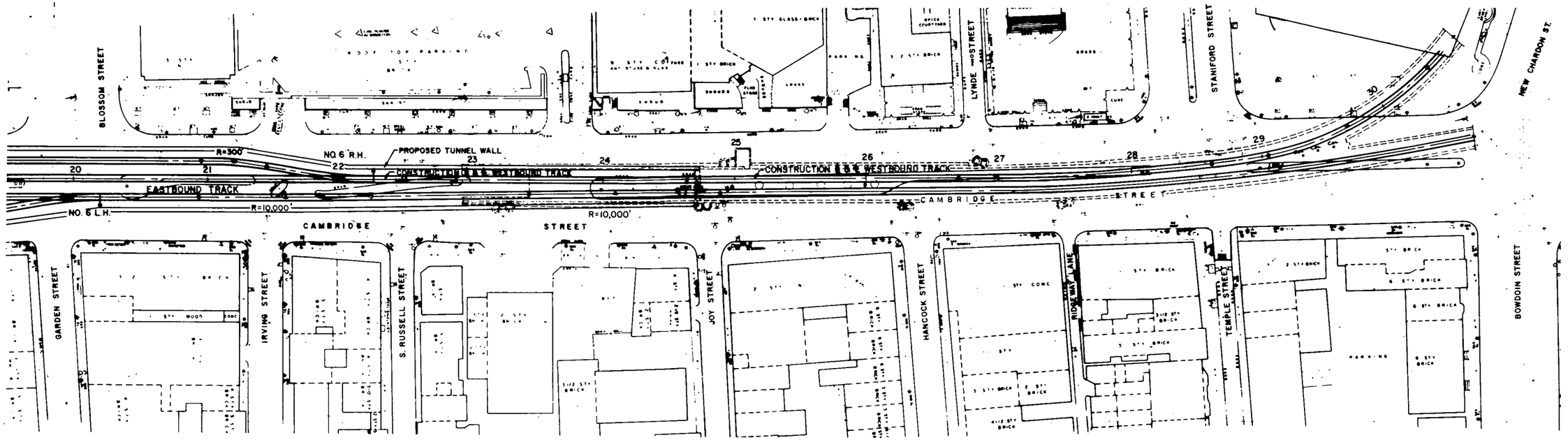
6 Howard Needles Tammen & Bergendoff / Thomas K. Dyer Inc., *Bowdoin / Charles Connector Project, Preliminary Design and Environmental Studies, Status Report, Volume 1 Executive Summary, p. ES-17*, November 1987.

maintained for vehicles, pedestrians, and deliveries. A construction staging plan will be developed in the SEIR with the goal of maintaining four traffic lanes on Cambridge Street during construction, maintaining pedestrian access to businesses, and limiting the temporary removal of parking and loading zones as much as possible.



PLAN 10-5-87
1"= 80'

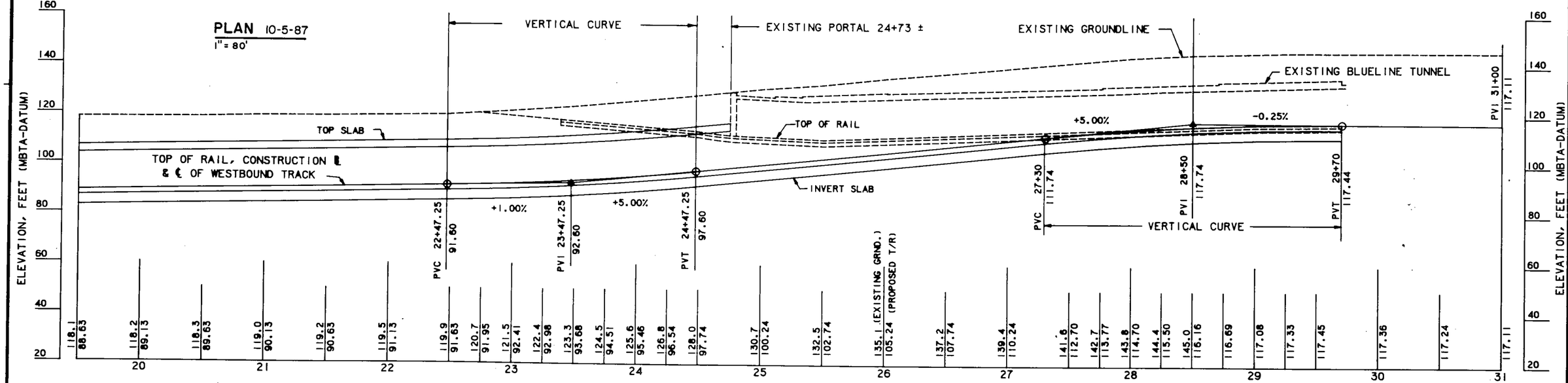


Figure 1

PROFILE 6-25-87
HOR. 1"=80'
VERT. 1"=40'

ISSUE DATE	DESCRIPTION	BY	CHKD	APP

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
BOSTON, MASSACHUSETTS

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY

Bowdoin/Charles Connector Project
MBTA Contract No. X2PS39

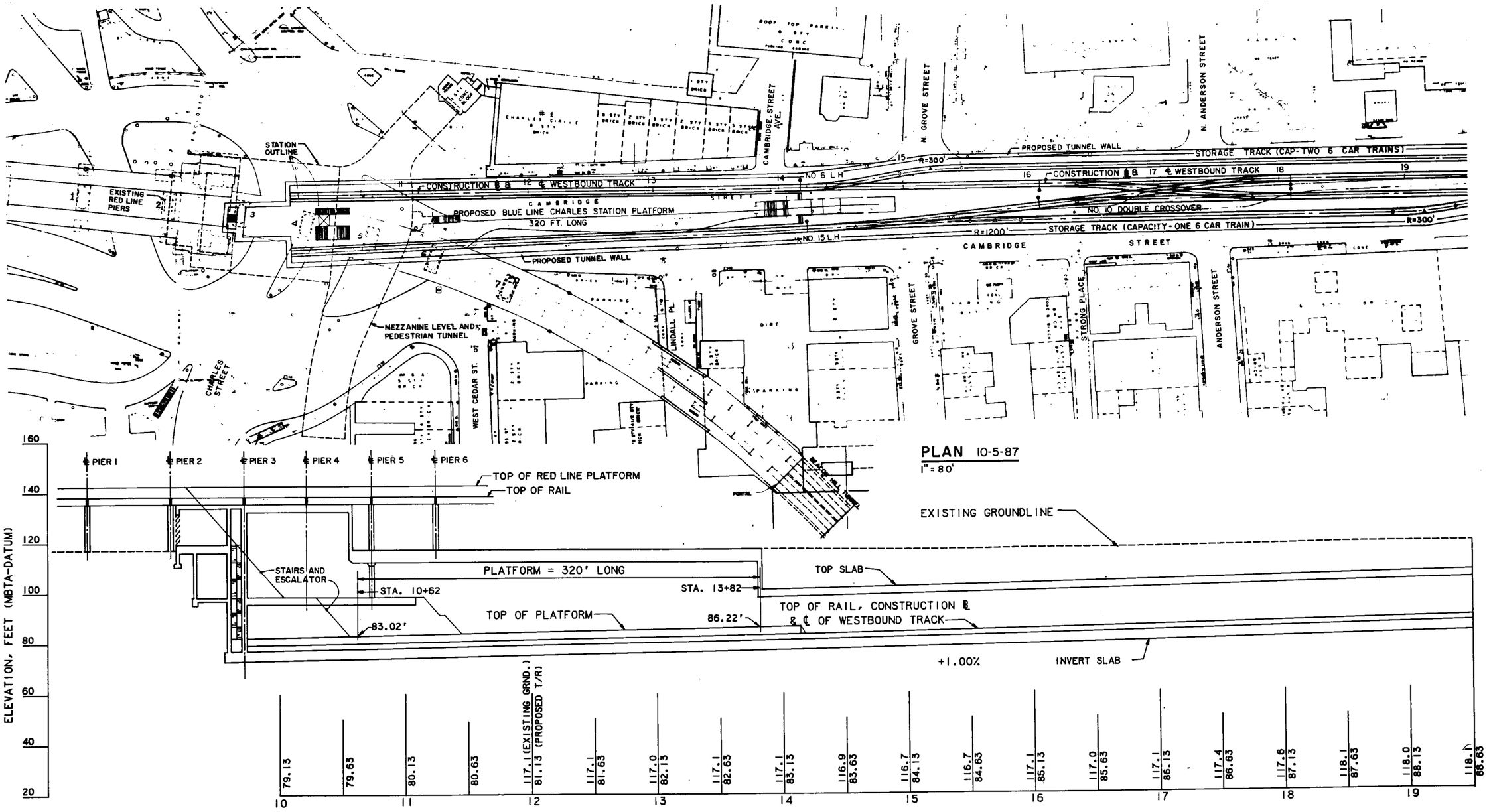
PRELIMINARY TRACK PLAN AND PROFILE STA. 19+50 TO 31+00

THOMAS K. DYER, INC.
LEXINGTON, MASS.

MASS. BAY TRANSPORTATION AUTHORITY NOTED BY

PROJECT MANAGER

SCALE: AS NOTED	DRAWN BY	DESIGN BY	CHECK BY	PLAN NO. T-SK-2 & 3	ISSUE
DATE: 6-17-87				SHEET	



PLAN 10-5-87
1" = 80'

PROFILE 6-25-87
HOR. 1"=80'
VERT 1"=40'

Figure 2

ISSUE DATE	DESCRIPTION	BY	CHKD	APP

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
BOSTON, MASSACHUSETTS

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY

Bowdoin/Charles Connector Project
MBTA Contract No. X2PS39

PRELIMINARY TRACK PLAN AND PROFILE STA. 10+00 TO 19+50

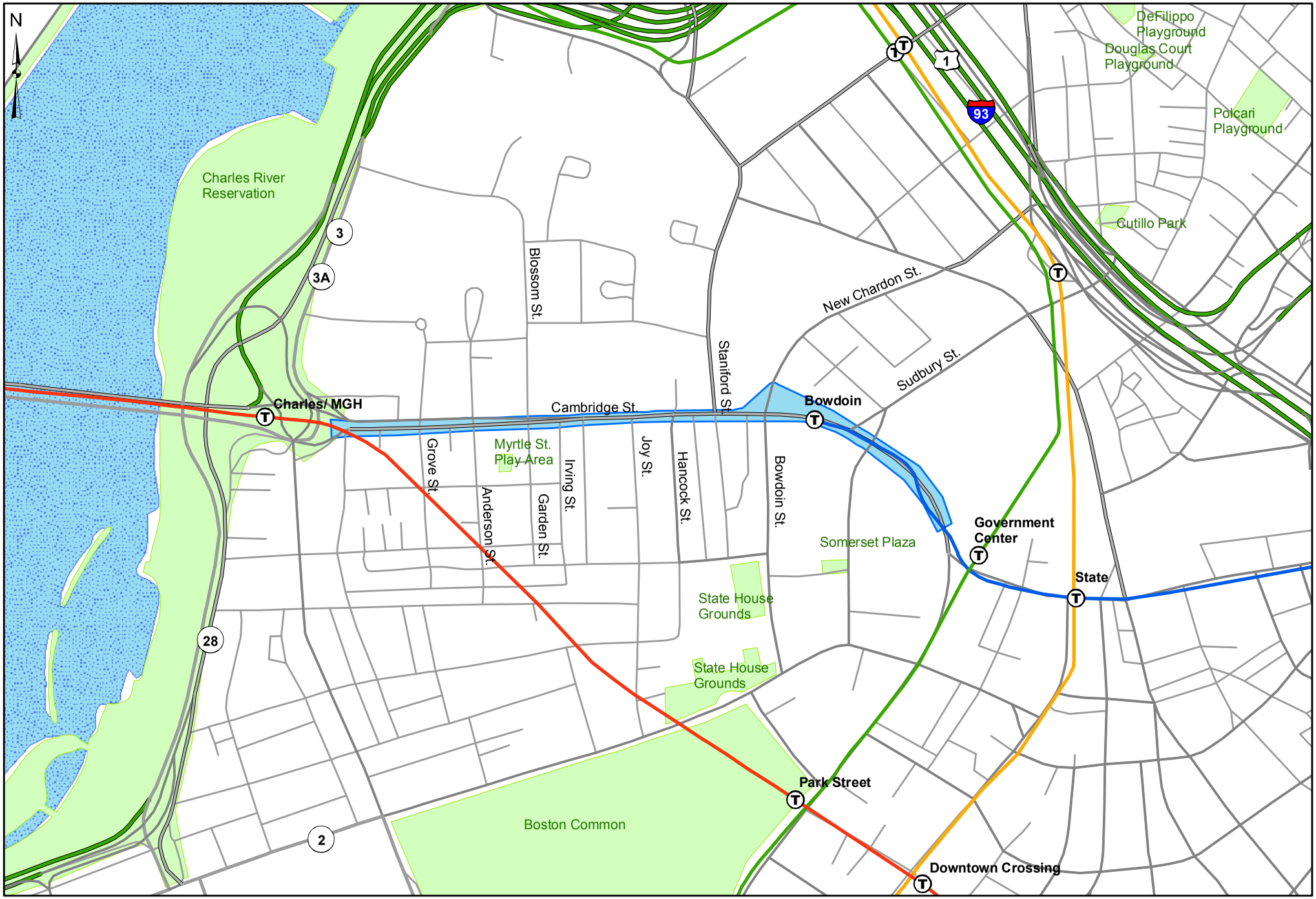
THOMAS K. DYER, INC.
LEXINGTON, MASS.

MASS. BAY TRANSPORTATION AUTHORITY NOTED BY

PROJECT MANAGER

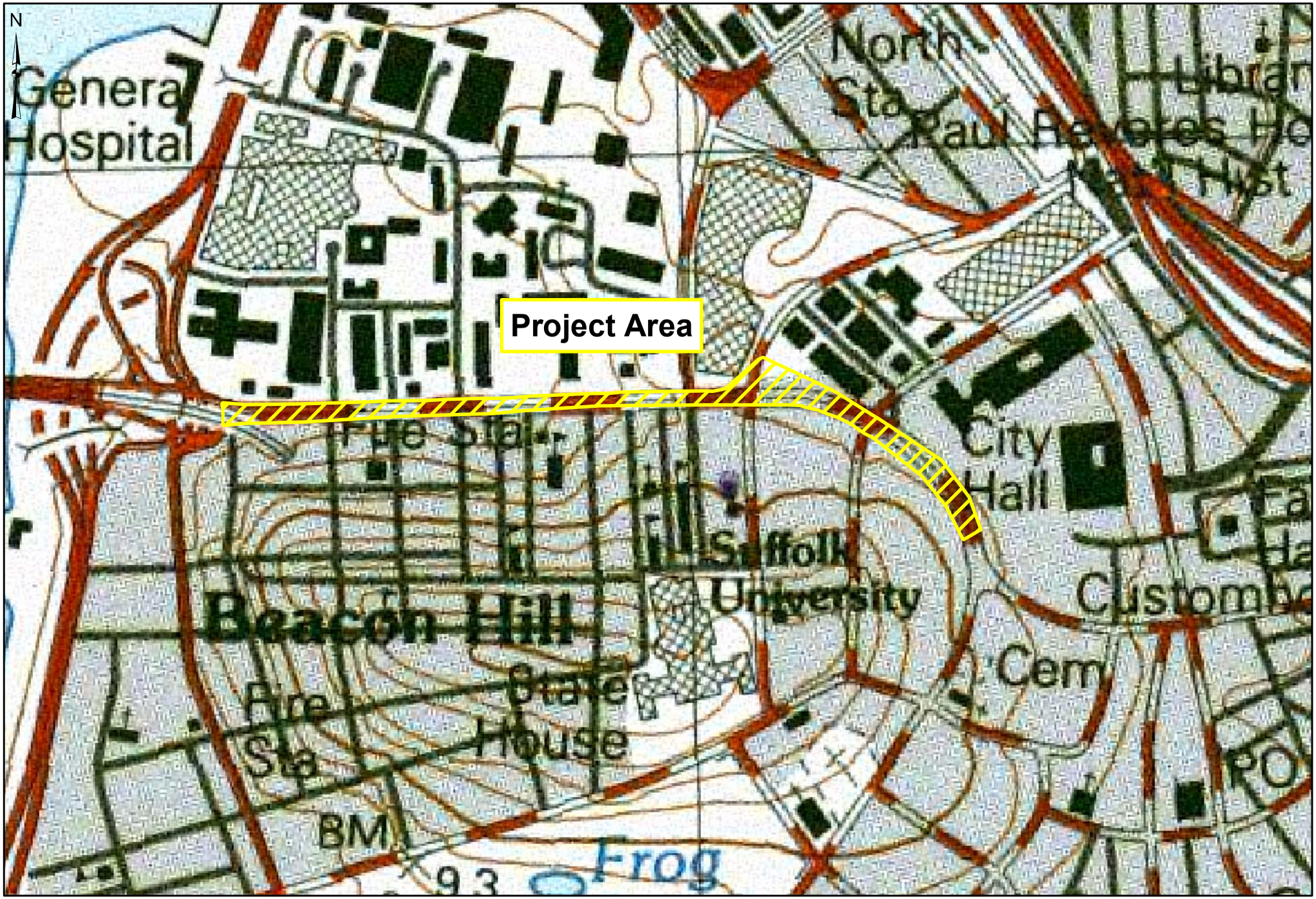
SCALE: AS NOTED	DRAWN BY	DESIGN BY	CHECK BY	PLAN NO. T-SK-1 & 2	ISSUE
DATE: 6-17-87				SHEET	

FIGURE 1


N
Charles River Reservation
DeFilippo Playground
Douglas Court Playground
Polcari Playground
Cutillo Park
3
3A
1
93
Blossom St.
Staniford St.
New Chardon St.
Sudbury St.
Charles/ MGH
Cambridge St.
Bowdoin
Grove St.
Myrtle St. Play Area
Anderson St.
Garden St.
Irving St.
Joy St.
Hancock St.
Bowdoin St.
Somerset Plaza
Government Center
State
State House Grounds
State House Grounds
28
Park Street
Boston Common
2
Downtown Crossing
MBTA Subway
BLUE
GREEN
ORANGE
RED
Stations
Red Line/ Blue Line Connector
Project Area
0
0.05
0.1
0.2
0.3
0.4
0.5
Miles
RED LINE/ BLUE LINE CONNECTOR
FIGURE 3
PREPARED FOR
EOT
PREPARED BY
TranSystems
Data Source: MassGIS

Attachment 3

Project Location



RED LINE/ BLUE LINE CONNECTOR
USGS MAP

PREPARED FOR EOT

PREPARED BY TranSystems

Data Source: MassGIS

Attachment 4

List of All Agencies and Persons Receiving the EENF

U.S. Department of Transportation
Federal Transit Administration
Kendall Square
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Cambridge, MA 02142-1093
Attn: Donna Laidley, Program Manager, Region 1

U.S. Department of Transportation
Federal Highway Administration
Transportation Systems Center
Kendall Square
55 Broadway, Suite 910
Cambridge, MA 02142-1093
Attn: Thomas Janikula

Executive Office of Transportation
10 Park Plaza
Room 3170
Boston, MA 02116
Attn: Bernard Cohen, Secretary

Executive Office of Environmental Affairs
MEPA Office
100 Cambridge Street, Suite 900
Boston, MA 02114
Attn: Ian Bowles, Secretary

Department of Environmental Protection
Commissioner's Office
One Winter Street
Boston, MA 02108
Attn: Steven G. Lipman, Environmental Engineer

Massachusetts Historical Commission
The MA Archives Building
220 Morrissey Boulevard
Boston, MA 02125
Attn: Brona Simon, Executive Director

Massachusetts Turnpike Authority
Central Artery/Tunnel Project
185 Kneeland Street
Boston, MA 02111
Attn: Michael P. Lewis, Director

Massachusetts Water Resources Authority
Charlestown Navy Yard
100 First Avenue
Boston, MA 02129
Attn: Marianne Connolly, Program Manager, Regulatory & Compliance

Boston Region Metropolitan Planning Organization
c/o Central Transportation Planning Staff
10 Park Plaza
Room 2150
Boston, MA 02116
Attn: Pam Wolfe, Manager, Certification Activities

Metropolitan Area Planning Council
60 Temple Place, 6th Floor
Boston, MA 02111
Attn: Barbara Lucas

Department of Conservation & Recreation
251 Causeway Street
Boston, MA 02114
Attn: Rick Sullivan, Commissioner

Massachusetts Bay Transportation Authority
10 Park Plaza
Boston, MA 02116
Attn: Andrew Brennan, Director of Environmental Affairs

Massachusetts Highway Department
10 Park Plaza
Room 3170
Boston, MA 02116
Attn: Luisa Paiewonsky, Commissioner

Massachusetts Aeronautics Commission
10 Park Plaza
Room 3510
Boston, MA 02116

City of Boston
Transportation Department
Boston City Hall
Room 721
Boston, MA 02201
Attn: Vineet Gupta

City of Boston
The Environmental Department
One City Hall Square
Room 805
Boston, MA 02201
Attn: Antonia Pollak

Boston Redevelopment Authority
One City Hall Square
Room 945
Boston, MA 02201
Attn: Richard Garver

City of Boston
Mayor's Office
1 City Hall Plaza
Boston, MA 02201

City of Boston
Public Library, Central Branch
700 Boylston Street
Boston, MA 02116
Attn: Gail Fithian, Curator of Government Documents

City of Boston
Public Library, East Boston Branch
276 Meridian Street
East Boston, MA 02128
Attn: Timothea McDonald, Branch Librarian

City of Boston
Public Library, Orient Heights Branch
18 Barnes Avenue
East Boston, MA 02128
Attn: Margaret Kelly, Branch Librarian

City of Boston
Public Library, West End Branch
151 Cambridge Street
Boston, MA 02114
Attn: Roberta Lewis, Branch Librarian

City of Boston
City Council Main Office
1 City Hall Plaza, 5th Floor
Boston, MA 02201

City of Boston
Public Health Commission
1010 Massachusetts Avenue, 2nd Floor
Boston, MA 02118

City of Revere
City Hall
Office of Mayor Thomas G. Ambrosino
281 Broadway
Revere, MA 02151

City of Revere
Office of Community Development
281 Broadway
Revere, MA 02151
Attn: Frank Stringi, City Planner

Revere Public Library
179 Beach Street
Revere, MA 02151

City of Revere
Board of Health
249R Broadway
Revere, MA 02151

City of Revere
Conservation Commission
Office of Planning & Development
City Hall
281 Broadway
Revere, MA 02151

City of Revere
Office of Planning & Development
City Hall
281 Broadway
Revere, MA 02151

City of Revere
City Council Chamber
City Hall
281 Broadway, Room 16
Revere, MA 02151

City of Chelsea
Jay Ash, City Manager
City Hall
500 Broadway
Chelsea, MA 02150

City of Chelsea
Office of Planning & Development
Chelsea City Hall
500 Broadway, Room 101
Chelsea, MA 02150
Attn: Ned Keefe, Director

Chelsea Public Library
569 Broadway
Chelsea, MA 02150
Attn: Robert Collins, Director

City of Chelsea
Board of Health
Chelsea City Hall
500 Broadway
Chelsea, MA 02150

City of Chelsea
City Council
Chelsea City Hall
500 Broadway, Room 306
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Town of Winthrop
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1 Metcalf Square
Winthrop, MA 02152

Town of Winthrop
Town Council
Winthrop Town Hall
1 Metcalf Square
Winthrop, MA 02152

Winthrop Public Library
2 Metcalf Square
Winthrop, MA 02152
Attn: John R. Cronin, Director

Town of Winthrop
Conservation Commission
Winthrop Town Hall
1 Metcalf Square
Winthrop, MA 02152

Town of Winthrop
Planning Board
Winthrop Town Hall
Town Manager's Office
1 Metcalf Square
Winthrop, MA 02152

City of Cambridge
Office of the Mayor
City Hall
795 Massachusetts Avenue
Cambridge, MA 02139
Attn: Honorable Kenneth E. Reeves

City of Cambridge
Community Development Department
238 Broadway
Cambridge, MA 02139
Attn: Beth Rubenstein

City of Cambridge
Traffic, Parking & Transportation Dept.
238 Broadway
Cambridge, MA 02139
Attn: Susan E. Clippinger

City of Cambridge
Transportation Dept.
344 Cambridge, MA 02139
Attn: Jason Schreiber

City of Cambridge
Community Development Dept.
344 Broadway
Cambridge, MA 02139
Attn: Sussane Rasmussen

Cambridge Historical Commission
Lombardi Building
831 Massachusetts Ave., 2nd Floor
Cambridge, MA 02139
Attn: Charles Sullivan

City of Cambridge
Public Library, Central Branch
449 Broadway
Cambridge, MA 02139
Attn: Susan Flannery

City of Cambridge
Public Library, East Cambridge Branch
48 Sixth Street
Cambridge, MA 02139
Attn: Reference Desk

City of Cambridge
City Council
Cambridge City Hall, 2nd Floor
795 Massachusetts Avenue
Cambridge, MA 02139

City of Cambridge
Public Health Department
119 Windsor Street, Ground Level
Cambridge, MA 02139

City of Somerville
Somerville City Hall
93 Highland Avenue
Somerville, MA 02143
Attn: Honorable Joseph A. Curtatone

Office of Mayor Curtatone
Somerville City Hall
93 Highland Ave.
Somerville, MA 02144
Attn: Meaghan Silverberg, Public Information Officer

City of Somerville
Traffic and Parking
133 Holland St.
Somerville, MA 02144
Attn: Todd Blake

Bill White
City of Somerville Alderman
16 Browning Rd.
Somerville, MA 02145

Somerville DPW
1 Franey Rd.
Somerville, MA 02143
Attn: Richard Willette

Tom Taylor
City of Somerville Alderman
32 Venal Ave.
Somerville, MA 02143

City of Somerville
Public Library, Central Branch
79 Highland Avenue
Somerville, MA 02143
Attn: Paul DeAngelis

City of Somerville
Health Department
City Hall Annex
50 Evergreen Avenue
Somerville, MA 02143

City of Somerville
Office of Strategic Planning & Community Development
Somerville City Hall
93 Highland Avenue
Somerville, MA 02143
Attn: Monica Lamboy

Honorable Michael E. Capuano
110 First Street
Cambridge, MA 02141
Attn: Jonathan Lenicheck

Honorable Edward J. Markey
5 High Street, Suite 101
Medford, MA 02155

Honorable Stephen F. Lynch
88 Black Falcon Avenue, Suite 340
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Senate District
State House
Boston, MA 02133

Representative, First Suffolk House District
State House
Boston, MA 02133

Representative Paul J. Donato
State House, Room 448
Boston, MA 02133

Representative Timothy J. Toomey, Jr.
State House, Room 39
Boston, MA 02133

Honorable Patricia Jehlen
State House, Room 213
Boston, MA 02133

Representative J. James Marzilli
State House, Room 443
Boston, MA 02133

Representative Denise Provost
State House, Room 167
Boston, MA 02133

Representative Carl Sciortino
State House, Room 39
Boston, MA 02133

Representative Robert DeLeo
Chairman, House Committee on Ways and Means
State House, Room 243
Boston, MA 02133

Representative Kathi-Anne Reinstein
State House, Room 167
Boston, MA 02133

Representative Eugene L. O'Flaherty
State House, Room 136
Boston, MA 02133

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The State Library of Massachusetts
State Librarian
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State Transportation Library
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Attn: Librarian

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Boston, MA 02199

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Boston, MA 02115

Robin Assaf
West End Civic Association
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Boston, MA 02115

Attachment 5.1

Bowdoin/Charles Connector Project
Preliminary Design and Environmental Study
Status Report
November 1987
Executive Summary

Produced by:
Howard Needles Tammen & Bergendoff /
Thomas K. Dyer, Inc.

Bowdoin / Charles Connector Project

EXECUTIVE SUMMARY

MBTA BOWDOIN/CHARLES CONNECTOR PROJECT
CONTRACT NO. X2PS39
BOSTON, MASSACHUSETTS

EXECUTIVE SUMMARY

Prepared by:
HOWARD NEEDLES TAMMEN & BERGENDOFF
Boston, Massachusetts

November 1987

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1. INTRODUCTION

This Preliminary Design and Environmental Studies Status Report presents work prepared under Phase I services for the Massachusetts Bay Transportation Authority's (MBTA) proposed Bowdoin/Charles Connector project in Boston, Massachusetts to the point at which the MBTA requested all design work be suspended. This request, made in the Summer of 1987, was prompted by the MBTA's desire to conduct an Alternatives Analysis as a result of MBTA General Manager James F. O'Leary's June 12, 1987 decision to seek Federal funding from the Urban Mass Transportation Administration (UMTA) for this project.

This Status Report represents a compilation of all individual technical reports prepared by the project team for the proposed Bowdoin/Charles Connector project. The purpose of these reports is to document work which has been completed to date so that a solid base of information exists from which future phases of work can draw upon. The DEIS/DEIR will be prepared concurrently with the preparation of the Alternatives Analysis (AA). The information contained in this Status Report will assist in the preparation of the AA/DEIS/DEIR and future preliminary and final design phases. The subway alternative extending the Blue Line below Cambridge Street from its existing terminus at Bowdoin Station to the existing Red Line at Charles Station, thereby connecting the MBTA Red and Blue Lines, will be one of the alternatives studied during this future AA/DEIS/DEIR work.

The basis for the preliminary design and environmental studies was the March 1987 Feasibility Study Final Report, Scheme 3, prepared by Seelye Stevenson Value & Knecht for the MBTA. The level of work and degree to which analyses and conceptual design are addressed in this Status Report vary from report to report depending on the nature of that report and the extent of work that had been completed at the point in which design was suspended. The reports prepared as part of the environmental studies generally consist of an inventory and analysis of existing conditions, while some reports also provide recommendations specific to the topic studied. The design related reports shown here generally consist of the data that had been gathered, issues that had been considered and any preliminary conceptual designs that had been prepared. Many of the reports for various disciplines will be used for both the environmental studies and preliminary design in a subsequent phase of work.

The Preliminary Design and Environmental Studies Status Report consists of eight (8) volumes composed of fourteen (14) technical reports, this executive summary and six (6) appendices. The 14 technical reports have been prepared by and with the assistance of Howard Needles Tammen & Bergendoff (HNTB) and all ten subconsultants who have been involved with this project.

Volume I, which is this volume, contains the Executive Summary. **Volume II** contains: the Preliminary Ridership and Cost-Effectiveness Analyses Report prepared by Charles River Associates Inc. (CRA); the Traffic Inventory and Analysis Report prepared by Howard Needles Tammen & Bergendoff (HNTB); and the Pedestrian and Curbside Usage Inventory and Analysis Report prepared by Howard/Stein-Hudson Associates, Inc. **Volume III** contains: the Urban Design Inventory and Analysis Report prepared by HNTB; the Preliminary Station

Architecture report prepared jointly by The Leon Bridges Company (TLBC) and HNTB; the Archaeological and Historic Resources Report prepared by Beth Anne Bower, Consultant; the Preliminary Trackwork, Signals, Communications and Traction Power Report prepared by Thomas K. Dyer, Inc.; and the Preliminary Engineering Report prepared by HNTB.

Volume IV contains the Noise and Vibration Conditions Report for the proposed Bowdoin/Charles Connector; Supplemental Report No. 1: MBTA Red Line Noise and Vibration Measurements Between Charles and Park Stations; and, Supplemental Report No. 2: Effectiveness of Rail Lubrication and Evaluation of Structure Radiated Noise - MBTA Red Line Between Charles Station and the Beacon Hill Portal, all of which have been prepared by Harris Miller Miller & Hanson Inc. (HMMH).

Volume V contains the Geotechnical Data Report, **Volume VI** contains the Preliminary Geotechnical Engineering Report and **Volume VII** contains the Preliminary Environmental Engineering Report all of which have been prepared by Goldberg - Zoino and Associates, Inc. (GZA).

Volume VIII contains the Appendices for the overall Preliminary Design and Environmental Studies Status Report. These appendices represent general information specific to the proposed project. **Appendix AA** contains the Environmental Notification Form prepared for this project; **Appendix BB** contains a list of Meetings Held with Public Agencies, Institutions, Community Groups, Utility Companies and Interested Parties and all minutes of meetings; **Appendix CC** contains the updated Project Mailing List as of November 1987; **Appendix DD** contains the updated Project Contact List; **Appendix EE** contains a List of Existing Plans that have been gathered for this project; and, Appendix FF contains the List of Materials Provided to Public Agencies, Institution, Community Groups, Utility Companies and Interested Parties throughout this phase of the project.

This Executive Summary includes a description of the project and individual summaries of each technical report.

2. PROJECT DESCRIPTION

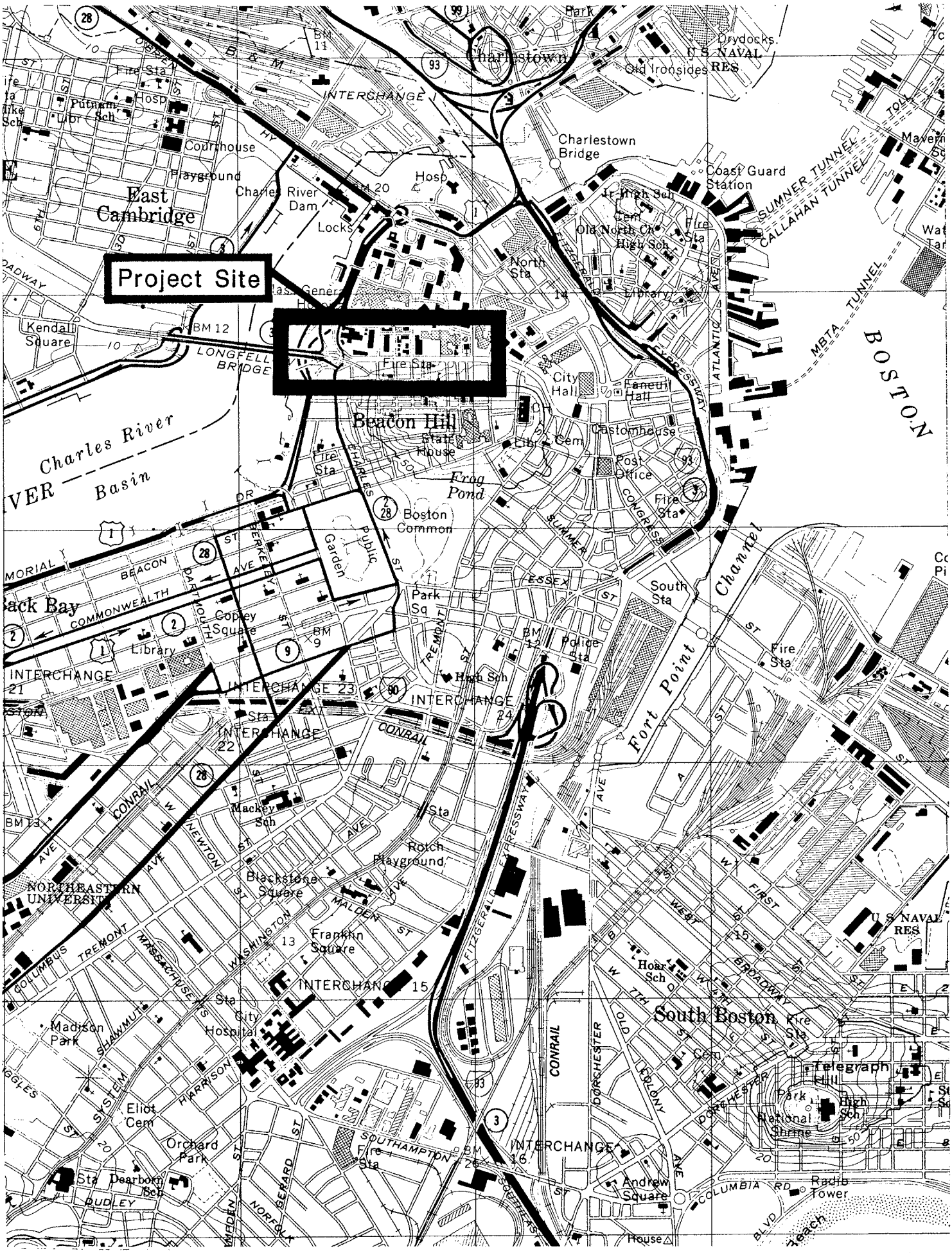
The proposed Bowdoin/Charles Connector project is located along Cambridge Street, in Boston, Suffolk County, Massachusetts, between the north slope of Beacon Hill and the south edge of the West End as shown in Figure 1. The project area is bounded by the Charles River on the west and Bowdoin Square on the east.

The proposed project involves establishing a previously existing link by extending the Blue Line below Cambridge Street from its existing terminus at Bowdoin Station to the existing Red Line at Charles Station, thereby linking the only two lines on the MBTA system that presently do not intersect. The proposed project has been advanced as a means of addressing a number of transportation problems and concerns in this corridor. Three of the principal objectives of the proposed project are: (1) to provide a direct connection for transit users traveling between North and South Shore communities on the Red Line (e.g., Cambridge and Quincy) and the areas served by the Blue Line, particularly Logan International Airport; (2) to reduce the level of congestion that currently exists at certain downtown stations and platforms by diverting to the proposed connector those individuals who otherwise must take either the heavily-used Green Line from Park Street to Government Center or the Orange Line from Downtown Crossing (Washington) to State Street; and (3) to increase central business district (CBD) distribution while improving access both to the major economic/employment centers and to health, educational, recreational, and regional transportation facilities.

The proposed subway tunnel will be constructed using either the conventional cut-and-cover or inverted method of construction tying into the existing Blue Line tailtracks at approximately Station 29+70, which is located roughly below Cambridge Street between Staniford and New Chardon Streets. (For the purpose of this report the centerline of the construction baseline corresponds to the centerline of the westbound track with the stationing increasing to the east towards Bowdoin). The proposed Charles Station will consist of a new below street level Blue Line platform connecting to the elevated Red Line platform through a system of escalators, stairways, and elevators. Station access will be provided on both the north and south sides of Cambridge Street via underground passageways. The proposed passageways feed into a common fare collection area for both Red and Blue Lines located on a mezzanine level below grade.

The proposed project involves reconstruction of Charles Circle and Cambridge Street from Charles Circle to approximately Bowdoin Square. For a portion of the tunnel, based on the proposed alignment, construction would occur approximately from face of curb to face of curb below Cambridge Street. Underpinning of some of the existing piers for the elevated Red Line structure will also be required in order to accommodate the new Charles Station.

A four year construction schedule is anticipated for this project. As presently understood, construction would commence in mid-1991 with completion of the project occurring in mid-1995. The length of disruption due to construction will vary depending on the construction method used for the tunnel and station areas and the type of decking used for maintaining traffic.



LOCATION MAP

Figure 1

The proposed project is located in a dynamic environment of great diversity. Immediately to the west is the Esplanade, which is included in the Charles River Basin Historic District along with the existing Charles Station, and the banks of the Charles River. Immediately to the north is the Massachusetts General Hospital, the Massachusetts Eye & Ear Infirmary and the Shriners Burn Institute, which comprise a hospital complex of world-wide recognition. Various historically significant structures such as the Old West Church, the Harrison Gray Otis House, the Charles Street (Suffolk County) Jail, and the Bulfinch Pavilion and Ether Dome, along with parking structures, a hotel, a library and a shopping center help to define the diverse northern edge of the project area. The eastern edge of the proposed project area abuts Government Center, a nucleus of city and state government offices and employment. The southern edge of the proposed project area is formed by the Beacon Hill Neighborhood which is considered primarily residential, but also includes the Northeast Institute, Suffolk University, some commercial land use and historically significant structures along the Black Heritage Trail.

Due to the proximity and direct access to the regional highway system and the downtown area, Cambridge Street is a major vehicular traffic link in Boston. Cambridge Street is a major urban arterial roadway connecting the downtown area at Government Center to the regional highway system via Storrow Drive (Embankment Road) at Charles Circle. Cambridge Street also acts as a collector/distributor roadway for the Beacon Hill neighborhood street network to the south and the hospital community and commercial establishments to the north. Due to its proximity to the hospital complex, Government Center, the North Station area and the Park Square area, many pedestrians use Cambridge Street to get to these major pedestrian origins/ destinations. Combined with its importance as a major arterial roadway and pedestrian route, Cambridge Street, beginning at Charles Circle with the Charles Station, is perceived as a gateway to the City of Boston from Storrow Drive and Cambridge.

3. SUMMARY OF TECHNICAL REPORTS

3.1 PRELIMINARY RIDERSHIP AND COST-EFFECTIVENESS ANALYSES

Preliminary Ridership Analysis

Since as early as the mid-1970's, the MBTA has considered the need to extend the Blue Line from its present terminus at Bowdoin Station to connect with the Red line at Charles Station. Currently these are the only two lines on the MBTA rapid rail transit system that do not intersect.

Without the Bowdoin/Charles Connector, individuals using the MBTA's rapid transit system between the Red and Blue line corridors must now make at least one additional transfer, using either the Green Line (from Park Street to Government Center) or the Orange Line (from Downtown Crossing to State Street) to complete their trip. Blue Line riders to or from Charles Station typically need to make two extra transfers. Besides the inconvenience of making this additional transfer, these individuals further contribute to the levels of congestion that exist on the already heavily-used downtown subway links.

By eliminating the additional transfer, users of the Red and Blue Lines will experience a reduction in wait and walk (also referred to as "out-of-vehicle") travel times that are generally associated with transferring. Some individuals will also experience a reduction in line-haul or in-vehicle times, as the connector will allow them to make a more direct transit trip. Other individuals, however, will decide to increase their in-vehicle time in order to save on transfer and out-of-vehicle time, as minute-for-minute in-vehicle time is widely perceived by riders to be less onerous than out-of-vehicle time.

Using information on the pattern of station-to-station flows on the rapid transit system, updated to reflect conditions in the base year 1986, along with an analysis of how service levels would be affected with the connector, estimates were made of the number of passengers that would be diverted to the connector from other rapid transit lines or stations as well as from other modes. Approximately 9,030 (one-way) transit trips per day would be taken on the connector in 1986 (base year). Using a typical annualization factor of 300 for subway trips, this represents about 2.7 million one-way trips taken annually on the connector in the base year for both diverted riders and new riders.

Preliminary Cost Effectiveness Analysis

In May 1984, UMTA issued a policy statement regarding the need to examine the cost-effectiveness, among other things, of projects involving major capital investments. In UMTA's statement, a major urban mass transportation investment was defined as any project that involves the construction of a new fixed guideway segment, or extension of an existing fixed guideway, for use by buses or rail vehicles.

The original cost-effectiveness (C/E) index proposed by UMTA was based on using only the number of new transit trips generated as a measure of project benefit. More recently, UMTA has proposed a revised cost-effectiveness index

that is based on evaluating the change in total user benefits between competing alternatives. This revised index was developed in recognition of several weaknesses identified in the original index since its focus was on the use of only "new transit trips" in the denominator to reflect all the different benefits that could be achieved by a proposed transportation infrastructure improvement.

Since the C/E indices are calculated by comparing the incremental costs and benefits of one proposal over another, the alternatives considered in this study include: (1) extending the Blue Line by approximately one-third of a mile to connect with the Red Line at Charles Station, and (2) upgrading the existing transit services as necessary to keep pace with the anticipated growth of employment and travel in and around the Boston metropolitan area.

Using ridership forecasts and related data produced by Central Transportation Planning Staff (CTPS) for the design year 2010, the original C/E index was calculated to be $9.76 per new trip and $9.70 per hour of user benefit. These results indicate that the cost-effectiveness indices of the proposed extension are sufficient to meet the thresholds of $10.00 per new trip and $12.00 per hour of user benefit established by UMTA. It is necessary to meet these threshold values in order to receive UMTA approval to conduct Alternatives Analysis Studies. It can be expected that subsequent studies undertaken for the MBTA will develop more refined estimates of both the costs and benefits of various alternatives that can achieve the stated project objectives and goals.

3.2 PRELIMINARY TRAFFIC INVENTORY AND ANALYSIS

The maintenance of vehicular access throughout Cambridge Street and Charles Circle during the construction phase of the project is a major issue. In order to adequately address this issue, a traffic program was established to determine existing conditions and constraints. Based on the analysis of the existing conditions, preliminary construction issues were addressed.

To determine existing conditions within the study area vehicular traffic data was collected from field investigations. The vehicular traffic data collected during field investigation includes: 24 hour Automatic Traffic Recorder (ATR) data; intersection turning movement count data; 12 hour curbside loading zone activity data; morning and evening origin/destination license plate survey data; and historical Charles Circle vehicular accident data. Using the traffic data collected for existing conditions, a base traffic network was created to reflect morning and evening traffic conditions.

Analyses of traffic conditions within the study area was performed using the existing base traffic network. The analysis results were used to identify problem areas that exist today as well as to form a basis for comparison with future construction and design alternatives. Although not necessarily significant in and of themselves, many of the problem locations are further aggravated by the heavy traffic volumes on Cambridge Street and at Charles Circle. Some of the factors impeding traffic flow through this area are:

- Traffic signal timing and phasing at the intersection of Cambridge Street with Bowdoin and New Chardon Streets;

- o Poor traffic signal progression on Cambridge Street (this problem has since been addressed by the Boston Transportation Department [BTD] resulting in some improvement in traffic flow);

- o On-street parking on Cambridge Street reducing the eastbound and westbound roadways to two travel lanes in many locations (the BTD has since instituted on a trial basis a Traffic Relief Improvement Program [TRIP] on Cambridge Street whereby peak hour parking restrictions are strictly enforced);

- o Cambridge Street acts as a bypass route for Storrow Drive traffic when congestion is experienced on Storrow Drive and at Leverett Circle; and

- o Pedestrian movement through the study area is difficult during the morning and evening peak hours.

Maintaing traffic flow in the project area during construction is of major concern. The uninterrupted flow of emergency vehicles to the hospital community must be maintained throughout the construction phase of the proposed project. Continuous fire and police vehicle access to the Beacon Hill neighborhood must be preserved. Pedestrian access and safety throughout the area must first be improved and then upheld during construction activities. Access to commercial establishments along Cambridge Street must be secured early on in the construction planning. Discouraging vehicular traffic from utilizing the Beacon hill neighborhood street network as an alternative route during construction is also a major issue which must be addressed.

3.3 PEDESTRIAN AND CURBSIDE USAGE INVENTORY AND ANALYSIS

This report summarizes pedestrian data collection and analysis related to Charles Station and Cambridge Street conducted for the proposed project. It also summarizes and analyzes curbside activity in those blocks along Cambridge Street which are dependent on Cambridge Street for front door loading. This was done in order to determine where access must be preserved during construction. Briefly summarized conclusions regarding existing conditions at Charles Station and on Cambridge Street are presented below.

Charles Station Pedestrian Flows

Pedestrian flows show that use of the existing Charles Station is oriented as much or more toward employment at the Mass. General Hospital/Mass. Eye & Ear Infirmary area and the park Square area as it is toward the Beacon Hill residential area. Today, the pedestrian pathways to the existing Charles Station are in poor condition, and capacity problems exist for the north and south walkways and the north stairway.

Cambridge Street Pedestrian Flows

In general, sidewalks, street corners and crosswalks along Cambridge Street are functioning well on both the north and south side of the street at all hours. While the southern sidewalks are narrower than those on the north side in some blocks, City of Boston sidewalk improvements have widened sidewalks in

some locations and added brick paving and other amenities. No capacity problems were observed based on pedestrian volumes counted in May 1987.

There are several locations where either total sidewalk width or effective sidewalk width (i.e. the unobstructed space actually available for pedestrian travel) is deficient in terms of desirable standards for an urban area such as Boston. These deficiencies should be corrected in the final design to create a 10′ sidewalk or, if not possible, at least a 5′ effective width through better location of street furniture. The deficient locations with respect to either the 10′ overall or the 5′ effective widths include:

South Side

- West Cedar to Grove Streets 8′ total, 3′ effective
- Grove to Anderson Streets 6′-10′ total, 3′ effective
- Anderson to Garden Street 8′ total, 5′ effective

North Side

- Charles Circle to North Grove Streets 10′ total, 4.5′ effective
- Sidewalk in front of Old West Church 9′ total, 3.25′ effective

In terms of crosswalks, perceived problems relate to the split phase signal timing and the traffic congestion which blocks travel across the street. Solutions for these problems must take into account the volumes of auto traffic which must be served by the intersections. To the extent that traffic volumes, conflicts, and congestion are reduced, the pedestrian environment will be correspondingly improved.

Curbside Usage

While several block faces of Cambridge Street are dependent on curbside loading in front of the businesses, this activity accounts for only one-quarter of the curbside use. Short-term parking and pickup and drop off of passengers account for three-quarters of the activity. Charles Circle, in particular, is an extremely busy drop off location. The maximum delivery volume in any block was forty vehicles over a twelve hour period, or fewer than four vehicles per hour.

Loading zones to accommodate one or two trucks should be preserved during the construction period in each of the following locations:

- Charles Circle, south side, from Charles to W. Cedar Streets
- Cambridge Street, both sides, from W. Cedar to Grove/N. Grove Streets
- Cambridge Street, south side, from Grove to Garden Streets
- Cambridge Street, south side, from Garden to S. Russell Streets
- Cambridge Street, south side, from Joy to Temple Streets

A pickup/drop off area should also be provided at Charles Circle during and after construction.

It is desirable to preserve off-peak metered parking along Cambridge Street as part of the final design where the spaces are well used and preserved for short-term parking by the meters. The block between Garden and South Russell Streets should also be preserved as a loading zone in the final Cambridge Street Design.

3.4 URBAN DESIGN INVENTORY AND ANALYSIS

To identify and understand the urban design implications, context and scope of the proposed project, nine exhibits were prepared to graphically document the findings of a comprehensive urban design existing conditions and analysis effort. The exhibits are supplemented by text which explains the data collection and analysis methodologies implemented to prepare them. They also summarize the information presented, highlight specific findings, and suggest goals for subsequent design phases. The exhibits are as follows:

Exhibit 1: Building and Open Space Land Use Inventory
Exhibit 2: Land Use Summary
Exhibit 3: Historically Significant Architecture and Districts
Exhibit 4: Pedestrian Oriented Land Use: Inventory and Analysis
Exhibit 5: Inventory of Vehicular Oriented Land Use
Exhibit 6: Pedestrian and Vehicular Level of Service Analysis
Exhibit 7: Cambridge Street Building Facades - North Elevation
Exhibit 8: Cambridge Street Building Facades - South Elevation
Exhibit 9: Urban Design Issues and Opportunities

The intent of the urban design survey and analysis of the Cambridge Street area is to establish a basis for the optimal urban design/streetscape improvement program. This report on the urban design inventory and analysis portion of the Bowdoin/Charles Connector project, in conjunction with the reports on Preliminary Station Architecture, Pedestrian and Curbside Usage Inventory and Analysis, Archaeological and Historic Resources, and Traffic Inventory and Analysis is intended to provide the solid foundation and framework for subsequent project design phases.

Cambridge Street and its environs is a diverse and dynamic urban area. It is surrounded by a distinctive group of unique and renowned land use districts. Cambridge Street is a seam between different urban landscapes and recognized districts in the City. It has the potential to thrive as a pedestrian and vehicular link between Fanueil Hall Marketplace, City Hall Plaza and downtown Boston to the east, the Esplanade and the Charles River to the west, and Beacon Hill to the south. The design of Charles Station can serve as a symbolic gateway to the City and as a visually dynamic focal point for Cambridge Street. An urban design/streetscape improvement program can serve to visually unify the disparate components of this project area, while responding to and enhancing the character of its historically significant architecture and districts.

Charles Circle may be perceived as an ambiguous and even threatening environment for pedestrians and bicycles. The area is dominated by a vehicular network which inhibits pedestrian movements. Balancing travel times and safety for drivers and the design of a safe, pleasant environment for pedestrians is a significant challenge. Interdisciplinary coordination between experts in traffic engineering and urban design can solidify strategies for improving the vehicular and pedestrian circulation and reducing the potential conflicts between their respective movements.

The Cambridge Street study area may be perceived as lacking visual coherence and unity. This highlights the need for an urban design "theme" which can visually unite the disparate components and architectural diversity of the

area. At the same time, urban design and streetscape improvements may improve the perceived quality of the pedestrian experience while enhancing the historically significant buildings. Streetscape improvements alone cannot comprehensively satisfy these goals. However, they can significantly contribute to improving the perception and identity of the project area as well as strengthening its role in the City of Boston.

3.5 PRELIMINARY STATION ARCHITECTURE

The Preliminary Station Architecture Report presents a critical evaluation of Scheme 3 from the Feasibility Study Final Report. This evaluation lead to the identification and resolution of problem areas within the Scheme 3 design. Emergency egress requirements were then established for the proposed station. Based on this initial work, preliminary goals and criteria and a preliminary program were developed. A set of conceptual station drawings were then prepared which reflect the elements identified in the station program.

A main priority of this preliminary work was to develop a conceptual station design which would be compatible with the neighborhood while providing a functional and operationally efficient building. The proposed design concept removes the existing elevated walkways and station headhouse, and provides new access to an underground mezzanine lobby through new development on the north and south sides of Charles Circle. The new mezzanine lobby contains the fare control booths and turnstiles and provides vertical circulation to the Blue Line platform below and the Red Line platform above. The new station would provide elevators for handicapped patrons and patrons with luggage, and escalators to make pedestrian traffic more comfortable and efficient. Closed circuit television would also be provided for security surveillance of the entranceways and platform areas.

The design's intent is to provide a safe, clean, modern facility which functions efficiently while providing a pleasant atmosphere. This is accomplished by providing clear sight lines from the collectors' booths to the entranceways and vertical circulation, by allowing as much natural light as possible into the station, by providing for clear direction and direct pedestrian flow, and by the use of aesthetically pleasing, low maintenance materials.

3.6 ARCHAEOLOGICAL AND HISTORIC RESOURCES REPORT

The Archaeological and Historic Resources Survey for the proposed project examined the potential for significant, intact archaeological resources within the project limits and identified and inventoried the historic structures in and adjacent to the project area. The historic resources portion of the study concludes that while Cambridge Street has bordering it examples from each historic period of West Boston's growth, none of the newly inventoried buildings retain a necessary level of integrity to constitute a significant structure by Federal, State or local criteria. Previously surveyed significant structures and districts, including the Old West Church, the First Harrison Gray Otis House, the Bulfinch Pavilion and Ether Dome, Hill House, the Charles Street Jail, the Longfellow Bridge, the Boston African American Historic Site, and the Beacon Hill Historic District, exist adjacent to the project limits. The proposed project will cross the boundaries of the Charles

River Basin Historic District and will significantly impact the existing Charles Station. This report determines that the existing Charles Station is not a contributing structure to the Charles River Basin Historic District, as it lacks integrity of design, setting, workmanship and feeling. It is recommended that further studies of the impact of project construction on the adjacent significant structures and districts listed above be undertaken in conjunction with geotechnical and engineering studies.

The study of potential archaeological resources within the proposed project limits concludes that significant archaeological resources would be associated with all periods of prehistoric occupation, the federal period West Boston community, the 19th-century Afro-American community and the late 19th- and early 20th-century immigrant communities. A review of existing conditions, soil boring information, and historical data indicates that the construction of wharves, pile supported buildings, sewers and other utilities, and the Blue Line tailtrack tunnel has destroyed any potentially significant archaeological resources. No further archaeological testing is recommended for the project limits. However, the research indicated that the area of Lindall Place and the city park at the corner of North Anderson and Cambridge Street my contain potentially significant archaeological resources such as 17th-century wharf structures and 19th-century components. Any subsurface work in these areas should be preceded by an archaeological testing program. In addition, should work related to the identification of stabilization of adjacent standing historic structures by undertaken, these activities should be coordinated with additional archaeological research.

3.7 PRELIMINARY TRACKWORK, SIGNALS, COMMUNICATIONS, AND TRACTION POWER

The proposed project requires the design, furnishing, construction, installation and testing of complete trackwork, signals, communications and traction power systems. The work includes interfacing with the existing systems on the Blue Line and on the Red Line at Charles Station.

Trackwork

Detailed survey data collected during the preliminary design phase of the proposed project and refinements to the station platform location have dictated some changes to the track alignment presented in the STV/SSVK Feasibility Study. The track design is in accordance with the Authority's design criteria for the Blue Line.

The track alignment extends west beneath Cambridge Street approximately 1420 feet beyond the end of the existing tailtracks at Bowdoin Station. The trackwork system includes two main tracks, two storage tracks, two station pit tracks, turnouts, crossovers and attenuated bumpers. Although the type of track structure has not been defined during this preliminary design study, a preference for a direct fixation floating slab system has been expressed by the Authority.

Signals

The signaling system extends from and includes Charles Station to Bowdoin Station including interfacing with the existing signal system on the Blue Line. The signal system shall be an automatic block system utilizing double

rail 60 Hz ac track circuits with impedence bonds, color light wayside signals, electric train stops and dual control electric switch and lock movements. Signaling shall be provided in the normal and reverse direction of traffic.

Other systems to be furnished and installed and other work to be performed includes an Automatic Train Dispatcher System, supervisory control and indication systems, haylon discharge and fire alarm systems and updating mosaic tile system indication panel and control machine at Dewey (MBTA control center).

Communications

The overall Communications system design concept for the proposed Charles Station includes: PBX telephone facilities, closed circuit television security surveillance, public address, automatic train arrival annunciator system, fiber optic transmission system, wayside telephones and alarms.

In addition to developing design concepts for new equipment to be located at the proposed Charles Station, the existing communications equipment located in areas that would be affected by the proposed construction were reviewed.

Traction Power

The traction power design for the proposed project encompasses the following: direct current feeder system including sectionalizing, control and indication; two 13.8 kV incoming lines from the utility company; and the contact rail system. The design interfaces with the existing signal power, traction power positive and negative return systems.

3.8 PRELIMINARY ENGINEERING

As part of the preliminary engineering data gathering process, an aerial survey was taken of the project area and 20 scale planimetric maps produced. These aerial planimetric maps were then field edited so that they could be used during preliminary design. Extensive ground survey was then taken to obtain vertical information such as cross-sections and utility inverts. This ground survey provided the base plans required for final design. In addition to aerial and ground survey performed, many existing plans were gathered to assist in the preliminary design process.

A preliminary method of tunnel construction, utilizing decking schemes, is presented considering decking scheme criteria, decking types and decking operations. The Tunnel construction was divided into three zones. The construction of decking will most likely be started in the Charles Circle area to approximately Sta. 11+39. The next zone would be from Sta. 11+39 to approximately Sta. 22+00. The final zone for decking would be from Sta. 22+00 to the end of the existing Blue Line Portal at Sta. 24+73. The construction procedure and type described in this report is a conventional cut and cover method used for subways which are close to the ground surface. Typically, this is the most economical method of construction. A different approach could be used to limit the disruption by utilizing precast girders for the roof of the station and tunnel to support the street and construction loads permanently.

This is called the "under the roof" method or inverted construction. A cost study should be done to investigate the time/cost differences between the use of a temporary decking method of construction and that of others such as the "under the roof" (inverted) method of construction.

Utility base plans were prepared showing all horizontal utility information collected from the various utility companies along with supplemental rim and invert elevations. These base plans were then distributed to all concerned utility companies for their review.

In addition to the horizontal utility information shown on the base plans, cross-sections were drawn along Cambridge Street to show as accurately as possible the various utilities vertical relationship to each other and to the proposed track and tunnel structures. These cross-sections were cut perpendicular to the track baseline at fifty foot intervals. Some were also drawn at "critical utility areas".

Some special topics relevant to the utility portion of this project were identified dealing with: the Massachusetts General Hospital Steam Plant, the Boston Edison new 345 kV Electric Cables, the MEEI Data Processing Center, the Massachusetts Water Resources Authority and AT&T Communications. These topics must be considered during final design.

3.9 NOISE AND VIBRATION CONDITIONS

Noise and vibration data are presented for the assessment of environmental impact of the proposed Bowdoin/Charles Connector project. Measurements of ambient noise along Cambridge Street confirm that this area has high noise level commensurate with locations along a busy urban arterial street. The existing levels are documented in this report for use in the environmental assessment in comparisons with expected noise from construction and future operations.

Predictions of future groundborne noise and vibration conditions in buildings near the proposed subway are based on source levels and propagation conditions in the intervening soil. This report includes results of vibration measurements of Blue Line trains for the source levels and vibration propagation measurements in the ground near Cambridge Street. In general, the data indicate conditions more conducive to efficient vibration propagation at the top of the hill near the Harrison Gray Otis House than at other locations further down towards Charles Street. Procedures for predicting the future vibrations in the environmental assessment are summarized within the report.

3.10 SUPPLEMENT NO. 1: MBTA RED LINE NOISE AND VIBRATION MEASUREMENTS BETWEEN CHARLES AND PARK STATIONS

Noise and vibration measurements were made on the Red Line between Charles and Park Street Stations during January 1987. Noise levels have increased dramatically in this section since the new trackwork was completed. Measurements identified wheel squeal as the primary problem and rumble of the elevated structure as the secondary, but still important, problem. Wheel screech dominates the noise spectrum, with levels of 105 decibels (dB) in the

one-third octave band centered at 3000 Hz, whereas measured levels in 1979 were about 87 dB in the same frequency band. Automatic rail lubricators are prescribed for mitigation of this excessive noise level.

Rumble noise from the elevated structure has also worsened in 1987 compared to 1979, not in increased level, but in a broader span of frequencies centered around 80 Hz. Vibration measurements on the deck and support beams of the elevated structure indicate that girder vibration may be the cause of most of the radiation of this low frequency noise. One treatment for girder vibration is constrained-layer damping; however, recommendations are for further analysis to be performed before application of this expensive treatment.

Further vibration measurements on the subway invert and on the street above the subway tunnel show an improvement of about 6 dB due to continuously welded rail compared to jointed rail. A characteristic peak in the vibration spectrum at 80 Hz caused by the Red Line trains appeared at all locations. The cause of this peak is not known, but it may be related to the behavior of the suspension of the trucks on the Red Line vehicle.

3.11 SUPPLEMENT NO. 2: EFFECTIVENESS OF RAIL LUBRICATION AND EVALUATION OF STRUCTURE RADIATED NOISE - MBTA RED LINE BETWEEN CHARLES STATION AND THE BEACON HILL PORTAL

This report describes the follow-up measurements of noise and vibration recommended in Supplement No. 1 after the rails were manually lubricated to eliminate the wheel screech between Charles and Park Stations. The results show that with manual rail lubrication, the high frequency wheel squeal is virtually eliminated. Automatic lubricators should eliminate the problem in the future.

Vibration measurements on the girders combined with nearby noise measurements showed that the low-frequency rumbling noise perceived in buildings at Lindall Place is generated by specific steel panels in three of the support girders. These panels have a maximum response around the frequency of 80 Hz, which coincides with a peak in the dynamic excitation caused by the Red Line vehicle.

This report recommends trials of a prototype damping treatment on selected girders, measurements of a train with trued wheel and tests of the truck frame to diagnose the source of the 80 Hz excitation.

3.12 GEOTECHNICAL DATA

This report summarizes the results of subsurface explorations, geotechnical field and laboratory testing of soils, and engineering interpretation of subsurface conditions. In addition, the report contains information regarding structures within and adjacent to the proposed tunnel alignment.

Soil Profile

Twenty-nine borings were performed as part of the exploration program to evaluate subsurface conditions along the proposed alignment. Four of these

boring were for vibration studies for Harris Miller Miller & Hanson Inc. One of the borings was advanced through the existing Blue Line tailtrack tunnel to evaluate the thickness of the invert and roof slabs, and the quality and quantity of water below the tunnel invert.

The boring information indicates that the subsurface profile along the proposed alignment, in sequence from the ground surface down, generally consists of strata of miscellaneous fill, organic silt and fine sand (tidal deposits), silty clay, glacial till, and bedrock. However, subsurface conditions are erratic and vary along the alignment. Localized strata of sand and gravel and silty sand are located between the organics and silty clay and between the silty clay and glacial till. Subsurface profiles are included in the report.

Groundwater

Recorded groundwater levels ranged between approximately elevations +106 and + 120 using the MBTA Datum (105.62 MBTA = 0.0 NGVD), typically 8 to 15 feet below the existing ground surface, based on monitoring of seventeen (17) observation wells installed during the boring program. It appears that groundwater generally flows towards Cambridge Street from Beacon Hill and from east to west towards the Charles River. In some locations, however, the water appears to flow from north to south and from south to north across Cambridge Street. Existing utilities are expected to influence the groudwater level.

Laboratory Testing

A laboratory program was conducted on samples obtained from the borings including classification tests, one dimensional consolidation tests and undrained triaxial compression tests. These tests were performed to evaluate the engineering properties of soils present at the site. Test procedures and results are included as an appendix to this report.

Existing Structures

The foundation type and bearing elevation of structures are important with respect to underpinning considerations. Buildings abutting the proposed alignment may require underpinning to reduce potential movements and settlement. Building permits available at the Boston Building Department were reviewed for foundation information about the existing building. In general, the permits indicated whether buildings were founded on "solid earth", fill, or piles. Foundation design plans were reviewed for several of the buildings to the north of Cambridge Street.

Foundation plans for the existing Red Line Charles Station and elevated approach structure also were reviewed since these structures are within or immediately adjacent to the proposed excavation and, therefore, will require underpinning.

In addition to buildings currently abutting Cambridge Street, historical information indicates that other buildings once existed within the limits of the presently existing street. Foundation and building debris form these structures may pose obstructions during excavation and installation of the earth support system. Old wharf structures also may be encountered along the alignment during construction.

3.13 PRELIMINARY GEOTECHNICAL ENGINEERING

This report addresses major geotechnical engineering issues related to the proposed tunnel and station including the effect of construction on existing structures, subsurface utilities and obstructions, groundwater control and street access. For the purpose of discussion, the report has been divided into three sections: the station area (Station 9+60 to 14+00), the new tunnel (Station 14+00 to 24+70) and the existing tailtrack tunnel (Station 24+70 to 31+00).

Construction methods considered for the station and tunnel area include conventional cut and cover construction and inverted construction. Inverted construction involves construction of the station walls and roof and then mining out the soil below roof level to construct the invert slab. This scheme was evaluated because it would minimize the amount of above-grade construction activities thus reducing the project's impact on vehicle and pedestrian traffic, and reducing noise pollution and its impact on the general public. Inverted construction would utilize slurry walls for temporary earth support, as well as the permanent tunnel walls. The structural feasibility, as well as further geotechnical evaluation of inverted construction, should be a major consideration in the final design phase.

Conventional cut and cover construction involves installing an earth support system and excavating to the proposed invert depth, constructing the tunnel, and backfilling over the tunnel to the ground surface. If this method were used, soldier pile and lagging walls appear to be the most economical earth support method east of Station 14+00 to the tailtrack tunnel. The permanent tunnel wall could be cast-in-place against the soldier pile and lagging wall. Slurry walls are recommended for earth support west of Station 14+00, including the new station area, to reduce ground movements, dewatering, and underpinning requirements. Loads from the existing station and approach structure possibly can be transferred to the underlying glacial till via the slurry wall provided the slurry wall can structurally support the loads.

The construction method employed in the tailtrack tunnel area is effected by the existing tunnel. Underpinning the existing tunnel wall to the required invert elevation and constructing a new invert slab should be considered. In locations where the proposed invert is greater than 8 to 10 feet below the existing invert of the tailtrack (approximately Stations 24+70 to 26+00), costs and time associated with underpinning the existing station my exceed those associated with demolition and new tunnel construction. Assessing the effect and economic feasibility of underpinning operations and earth support system, particularly on the existing tunnel, is an iterative process requiring both geotechnical and structural input, and should be addressed during final design.

Groundwater control is a major issue for the three areas, but especially for the tunnel and station areas. Preliminary engineering indicates that the glacial till stratum below the silty clay will have to be depressurized during construction to limit the potential of the bottom blowing into the excavation. The depressurization can be achieved by deep dewatering wells installed along the length of the alignment. Recharge wells also will be required on both sides of the excavation to avoid decreasing the piezometric water level in the silty clay and causing settlement.

The shallow groundwater table in the fill also is an issue. To avoid settlements due to consolidation of the silty clay and organics, the groundwater table should be maintained at its current elevation.

Underground obstruction and existing utility lines will impact construction. As discussed in the Geotechnical Data Report, historical information indicates that building debris and old wharf structures may be within the proposed alignment. Existing utilities will have to be relocated prior to and/or supported during construction.

3.14 PRELIMINARY ENVIRONMENTAL ENGINEERING

This report presents the environmental data collected for the proposed Bowdoin/Charles Connector project. Preliminary engineering evaluations regarding handling and disposal of excavated material and health and safety are also addressed.

The initial phase of work entailed review of available records for present and past uses of properties adjacent to the proposed site. These included: City Directories, Resource Conservation and Recovery Act (RCRA) files for potential generators of hazardous materials or oil; Department of Environmental Quality Engineering (DEQE) files for reported oil spills, hazardous waste spills, and leaking underground tanks; and Boston Fire Department records for the presence of underground fuel storage tanks. This information indicated that Cambridge Street historically has been abutted by service stations, garages, and dry cleaners. These types of businesses are viewed as potential sources of contamination. As such, discrete sampling and quantitative environmental testing were emphasized in these areas while composite sampling and screening/ index testing was utilized in other areas to provide a general overview of potential contaminants. Where screening data indicated probable contamination, additional quantitative analyses were also utilized.

Chemical analyses were performed on selected soil, track ballast, groundwater, and soil-gas samples obtained from explorations performed along the proposed Cambridge Street alignment. Samples were analyzed for volatile organic compounds, acid and base neutral extractable, PCB's, pesticides, oil and grease , petroleum hydrocarbons, and metals. Indicator parameters including pH, specific conductivity, total dissolved solids, and/or chloride ion concentration also were used. The report focuses upon the chemical characteristics of the fill deposits, natural soils, groundwater, and soil-gas since these characteristics may impact the ultimate handling and disposal of excavated material, construction dewatering, and worker safety.

The analyses conducted to date indicate a discontinuous distribution of various contaminants in the soil, particularly the fill. Specifically, petroleum hydrocarbons (PHC's), polycyclic aromatic hydrocarbons (PAH's), lead, 3,3'- dichlorobenzidine, and oil and grease are of potential concern. The contamination pattern, however, does not suggest a single concentrated source for most of these contaminants.

Disposal and handling of contaminated soil during construction may prove to be problematic and on-site monitoring of excavated material probably will be required. While it is likely that only portions of the fill, tidal deposits,

and ballast will require special handling, potentially contaminated material may have to be stockpiled on-site, sampled and tested prior to disposal. Additional testing will be required to evaluate the materials with respect to potential disposal sites, each site possibly requiring a slightly different host of tests.

Current data indicate low levels of organic contamination in groundwater and soil-gas in the vicinity of Cambridge Street. Past site usage suggests that petroleum contamination should be anticipated. Low levels of dissolved metals were also found. High specific conductivities and high chlorides are evident in the groundwater permeating the fill and glacial till strata. While these elevated values are naturally occurring in areas with a history of marine influence, they may affect the disposal of water pumped from within the excavation. The DEQE will probably require a permit for such discharge, and the owner/contractor will have to demonstrate that this discharge will not pose a threat to the receiving surface water body. As an alternative to disposal, this water may be used to recharge the groundwater table, although special permits will still be required. The design of the permanent structure may also require provisions to address potential volatilization of organic compounds in groundwater which leaks into the tunnel and/or via diffusion through the tunnel walls.

Based on the work to date it is recommended that additional environmental sampling and analyses be performed directly within the construction alignment and in areas exhibiting a high probability of contamination. It is further recommended that a formal health and safety plan be developed and followed during construction. In addition, it should be recognized that formal State or Federal standard covering handling and disposal of soils and groundwater do not exist. Individual projects are evaluated by the State on a case by case basis. Therefore, DEQE should be consulted during final design when evaluating disposal options.

4. CONCLUSION

The preliminary design and environmental studies presented in this Status Report represent a sizable work effort providing a valuable base of information from which future phases of work can draw upon. The information contained in this Status Report will assist in the preparation of the AA/DEIS/DEIR and future preliminary and final design phases. The subway alternative extending the Blue Line below Cambridge Street from its existing terminus at Bowdoin Station to the existing Red Line at Charles Station will be one of the alternatives studied during this future AA/DEIS/DEIR work. All work elements have been documented in a format such that they can be easily referenced during subsequent phases of the project.

Attachment 5.2

Excerpt from 2003 Program for Mass Transportation

(from Journey to 2030, Transportation Plan of the Boston Metropolitan Planning Organization)

BLUE–RED CONNECTOR

Description

This project would extend the Blue Line from Bowdoin Station in Boston to the Charles/MGH Red Line Station via a new subway, allowing a direct transfer between these lines. The Blue Line–Red Line Connector is a SIP, CA/T, and ACO legal commitment.

Capital Features

This would be a 0.4-mile extension, entirely in a new subway, including the addition of a new level to the Charles/MGH Station. (Bowdoin Station is scheduled to be closed in conjunction with implementation of six-car train service on the Blue Line.)

Capital Cost	**$174.6 million (Based on 2000-2025 RTP update)**
Operating Cost	**$7,200 per weekday**
Daily Ridership Increase on Mode	**6,500**
Net Increase in Daily Transit Ridership	**2,800**
Capital Cost per New Transit Rider	**$63,500**
Operating Cost per Wkday/New Transit Rider	**$2.60**
Capital Cost/Travel Time Benefit	**$107,500 per hour**
Operating Cost/Travel Time Benefit	**$4.50 per hour**
Travel Time Savings	**1,625 hours per weekday**

UPDATED COST

$222 million

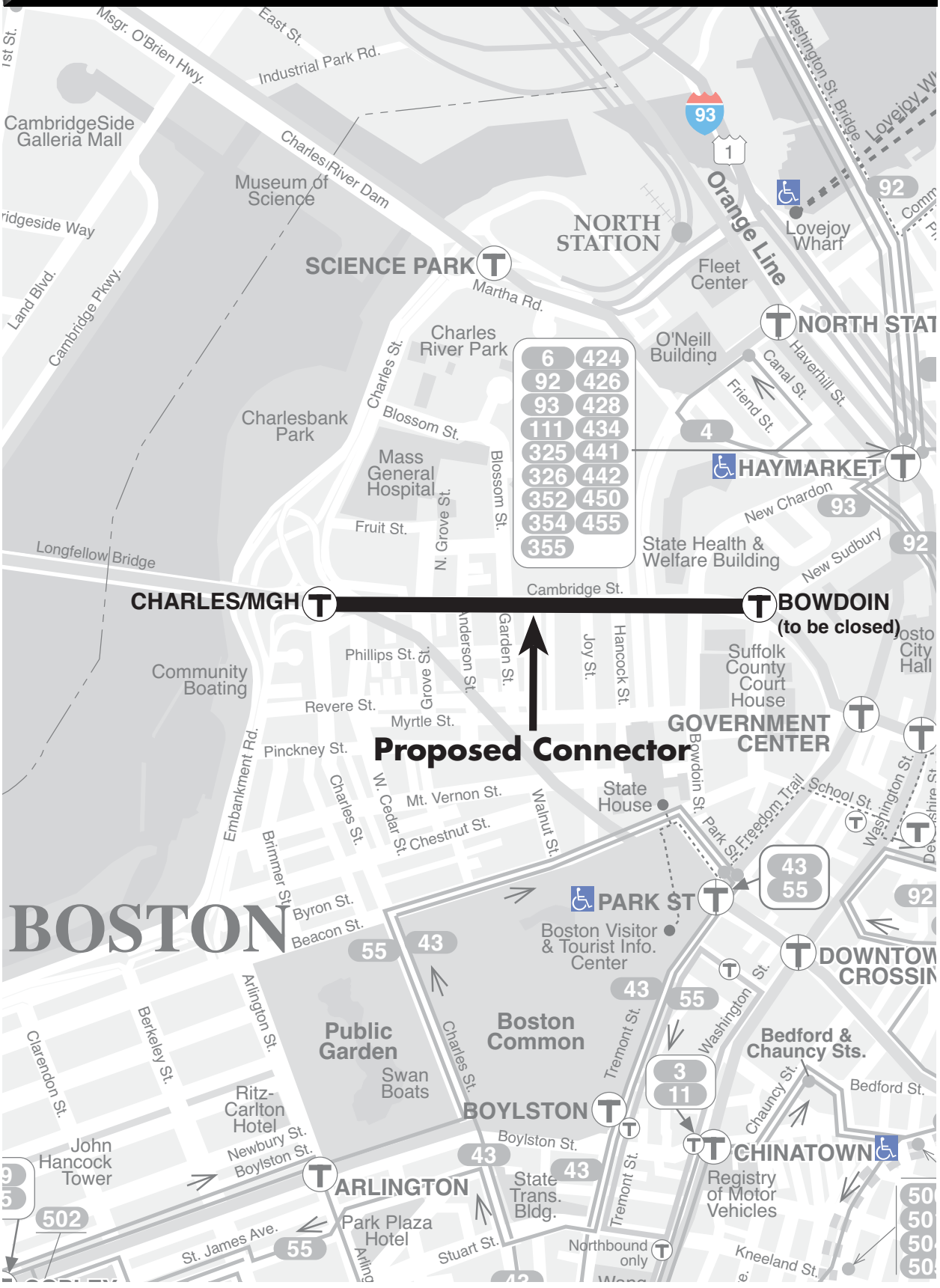
(3%/year inflation)

Assessment

Overall, this project is rated medium priority. Capital cost would be in the mid-range among rapid transit extension projects analyzed. It would be among the more cost-effective projects in terms of capital cost relative to new transit rider and to air quality improvements. Operating cost per new passenger would be among the lowest of any project. The connector would permit direct transfers between the Blue Line and the Red Line for the first time. It would be used mostly by passengers traveling between Red Line stations from Alewife to Charles/MGH inclusive and Blue Line Stations from State to Wonderland (or beyond if the Blue Line is extended in that direction). It is rated high in economic and land-use development impacts. It would be located in a state-designated revitalization area, where local plans call for mixed-use development. The MBTA will soon begin work on an analysis of the Blue Line–Red Line Connector that will provide greater detail on this project.

Source: 2003 Program for Mass Transportation
Boston Region MPO: Regional Transportation Plan 2004-2025

MAP 2-2 BLUE-RED CONNECTOR



Attachment 5.3

MBTA Analysis of Bowdoin Loop Operations

SIX CAR TRAIN TEST AT BOWDOIN STATION

LOCATION:

Bowdoin Station east and west including the Bowdoin loop.

VEHICLES:

Consist 0604, 0605, 0626, 0625, 0644, and 0645

DATE:

January 13, 2007

TIME:

12:00 AM to 4 AM

PURPOSE OF TEST:

A six car train, using Blue Line No.4 cars, was brought to Bowdoin station to determine the number of cars that could be unloaded and loaded on the west and east platforms and the modifications required to maximize passenger unloading and loading.

Second, the train was located in the Bowdoin loop to determine if passengers could be evacuated from the train in the event on an incident with passengers on the train.

DESCRIPTION OF THE TEST:

The six car train was located on the west platform to verify that six cars can be unloaded.

The six car train was then moved to the Bowdoin loop to determine if passengers could be evacuated from the train in the event of an incident. A video of the evacuation route within the train consist was video taped by the training department. Pictures were also taken by Blue Line engineering and the Track Department.

The six car train was located on the east platform so the edge of the first door on the second car was line with the platform gate on the east end of the revenue platform. This was to determine if five cars can be loaded on the existing platform. The lead car was in the unused area of the platform.

The six car train was then located to determine the possibility of loading five cars on the used and unused east platform.

Took a line of sight view from the lead car of a six car train to determine motorperson visibility of a six car train on the east side.

SIX CAR TRAIN TEST AT BOWDOIN STATION

TEST RESULTS:

West Platform - All six cars can be unloaded and loaded.

Bowdoin Loop – Passengers cannot be evacuated from the train. The radius of the Bowdoin loop is such that the collision post of a car obstructs approximately one half the width of the end door on the adjacent car. An instructor in a stretcher could not be evacuated through the train.

Difficulty was encountered securing the emergency ladders at the ends of the train. The radius on the front of the train did not allow the ladder to be properly secured. The running rail interfered with placement of the ladder on the end of the train.

The ladder could be properly secured with a side door exit. However, the third rail was on both sides of the train.

There were large gaps between the cars that created a safety hazard for passengers and train personnel evacuating passengers.

East Platform with Five Cars Using Current Platform – It was possible to locate five cars on the current revenue service platform with the six car train located on the east platform so that the edge of the first door on the second car was line with the platform gate. However, the gap between the platform and sixth car was 11 inches for the first door and 14 inches for the second door. There was no visual line of sight down the train consist. The motorperson will have to rely on a monitor. The doors cannot be opened on the lead car in the unused east end platform area unless electrical equipment is moved for passenger egress. The minimum width of the platform is 4 feet 11 inches. There is a requirement for platform width. The west side of the platform will have to be fenced or blocked to protect passengers from the right of way. Columns in this area are 33 inches from the edge of the platform which could create a safety hazard when pushing a passenger in a wheel chair. Unused east platform length is 65 ½ inches.

OPTIONS:

East Platform with Four Cars Using Current Platform – The last four cars can be located on the platform in the same position as trains currently in revenue service. The first two cars can then be located east of the platform gate. Passengers can load in the second car which will permit five cars to be loaded. Platform changes will have to be made as described above. The first car will have to be modified to prevent doors from opening. The lead car was in the tunnel with a tight clearance which makes locating a monitor extremely difficult.

Attachment 5.4

Supplemental Information Developed for the EENF

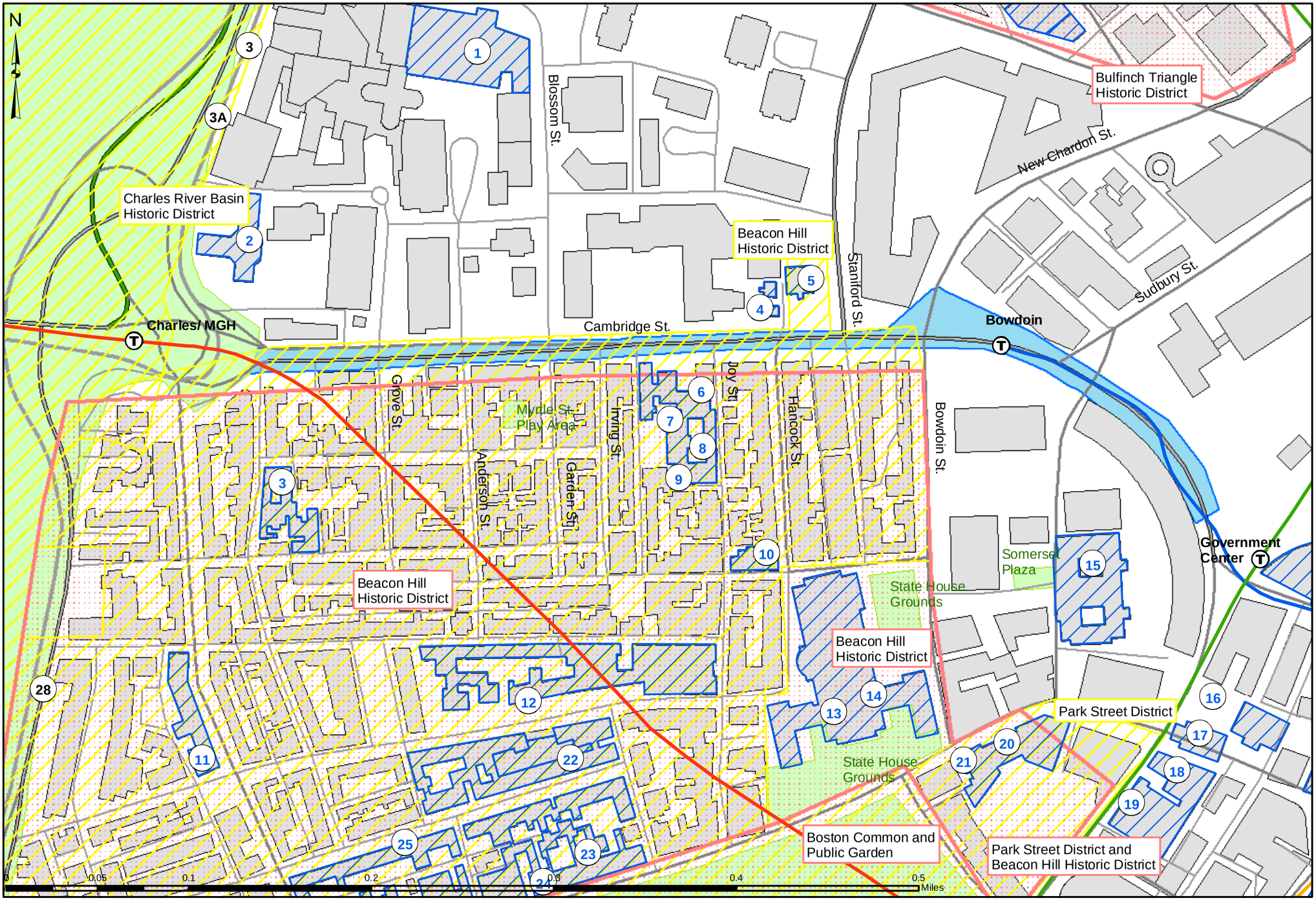
Historic Places

Recreation and Open Space

Environmental Concerns

Water-Related Sites

Hazardous Sites



MBTA Subway
- ORANGE
- RED
- BLUE
- GREEN

Ⓣ Stations

Red Line/ Blue Line Connector
- Project Area

Historic Places
- National Historic Districts
- Local Historic Districts
- Building Footprints of Historical Sites
- Historic Sites

Please see Site Key on following page

RED LINE/ BLUE LINE CONNECTOR HISTORIC PLACES

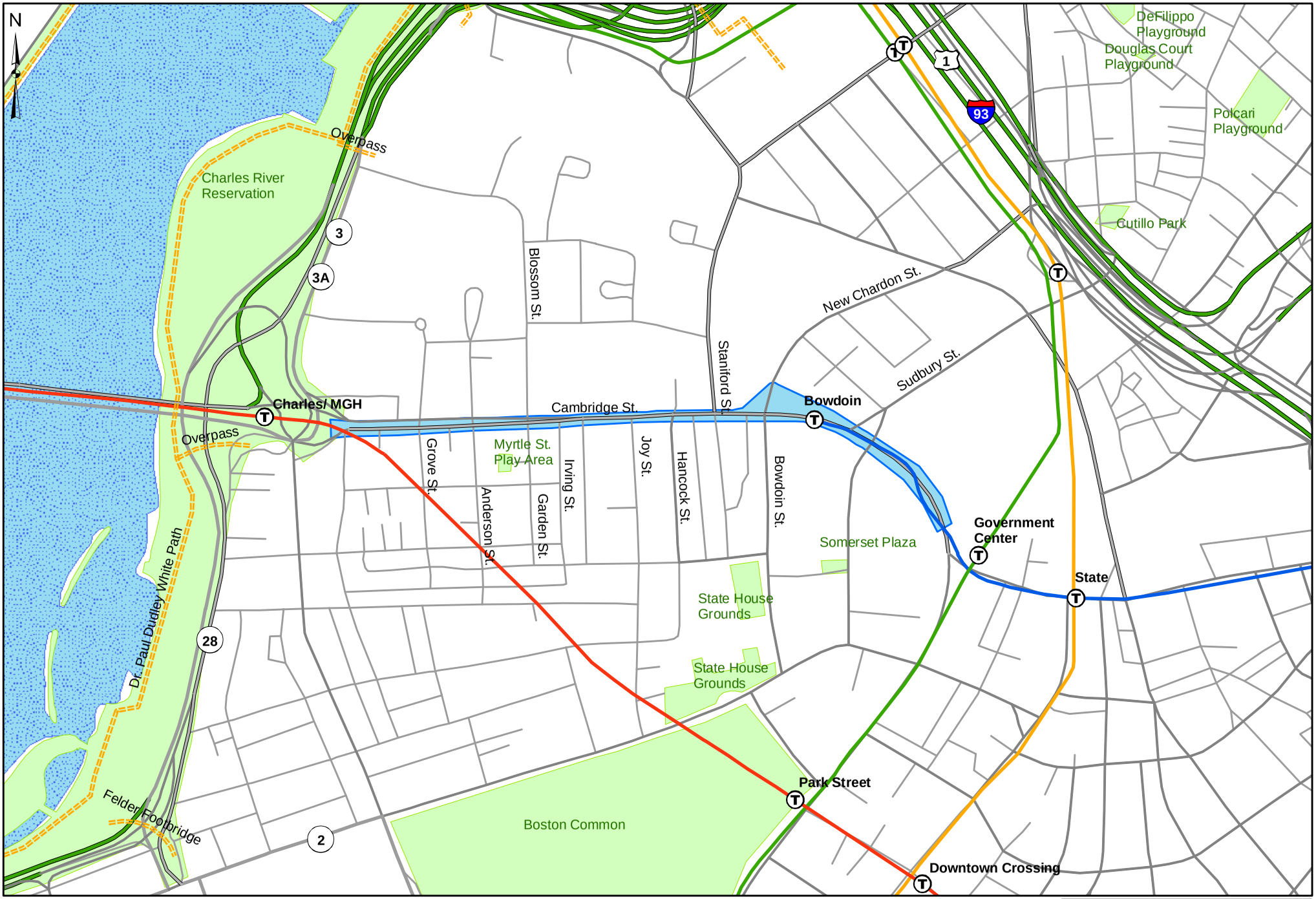
PREPARED FOR EOT

PREPARED BY TranSystems

Data Source: MassGIS

Key to Map of Historic Sites

Site No.	Historic Name/Common Name	National Registry No.	Massachusetts Registry No.	Address
1	Massachusetts General Hospital- Ether Dome	70000682	BOS.9037	Fruit St.
1	Massachusetts General Hospital- Bulfinch Building	70000682	BOS.4201	Fruit St.
2	Suffolk County Jail/Charles Street Jail	80000670	BOS.4200	215 Charles St.
3	Lewis Hayden House	Unknown	BOS.4088	66 Phillips St.
4	First Harrison Gray Otis House/SPNEA Headquarters	70000539	BOS.4183	141 Cambridge St.
5	Old West Church/West End Church	70000691	BOS.4182	131 Cambridge St.
6	Boston Police Station #3/Hill House	Unknown	BOS.4090	74 Joy St.
7	Peter Faneuil School/Peter Faneuil School	94001492	BOS.4087	30 South Russell St./ 60 Joy St.
8	William C. Nell Residence/Thomas P. and James Taylor Scott House	76001979	BOS.4093	3 Smith Court
9	African Meeting House/First African Baptist Church- Abolition Church	71000087	BOS.4085	8 Smith Court
10	Charles Sumner House	73001953	BOS.4096	20 Hancock St.
11	Charles Street Meeting House	Unknown	BOS.4074	Charles St.
12	Second Harrison Gray Otis House	73001955	BOS.4084	85 Mt. Vernon St.
13	Massachusetts State House	66000771	BOS.4092	Beacon Hill
14	Senate Reception Room	Unknown	BOS.9030	Beacon St.
15	John Adams Courthouse/Suffolk County Court House	74000391	BOS.1945	Pemberton Square
16	King's Chapel Burial Ground	Unknown	BOS.803	Tremont St.
17	King's Chapel	74002045	BOS.2067	58 Tremont St.
18	Parker House	86003804	BOS.1973	50- 62 School St./ 60- 68 Tremont St.
19	Tremont Temple Baptist Church	86003803	BOS.2070	76- 88 Tremont St.
20	Boston Athenaeum	66000132	BOS.1547	10 1/2 Beacon St.
21	Chester Harding House	66000764	BOS.1549	16 Beacon St.
22	Samual Gridley Howe and Julia Ward Howe House	74002044	BOS.4091	13 Chestnut St.
23	Nathan Appleton Residence/Appleton- Parker Houses; Women's City Club; David Pickney House	77001541	BOS.4086	39- 40 Beacon St.
24	David Sears House/Somerset Club	70000731	BOS.4095	42 Beacon St.
25	Francis Parkman House/F.S. Bowditch House	66000782	BOS.4094	50 Chestnut St.



MBTA Subway
BLUE
ORANGE
RED
GREEN
Stations
Red Line/ Blue Line Connector
Project Area
Protected Open and Recreation Space
Bicycle Trails
Recreational Trails

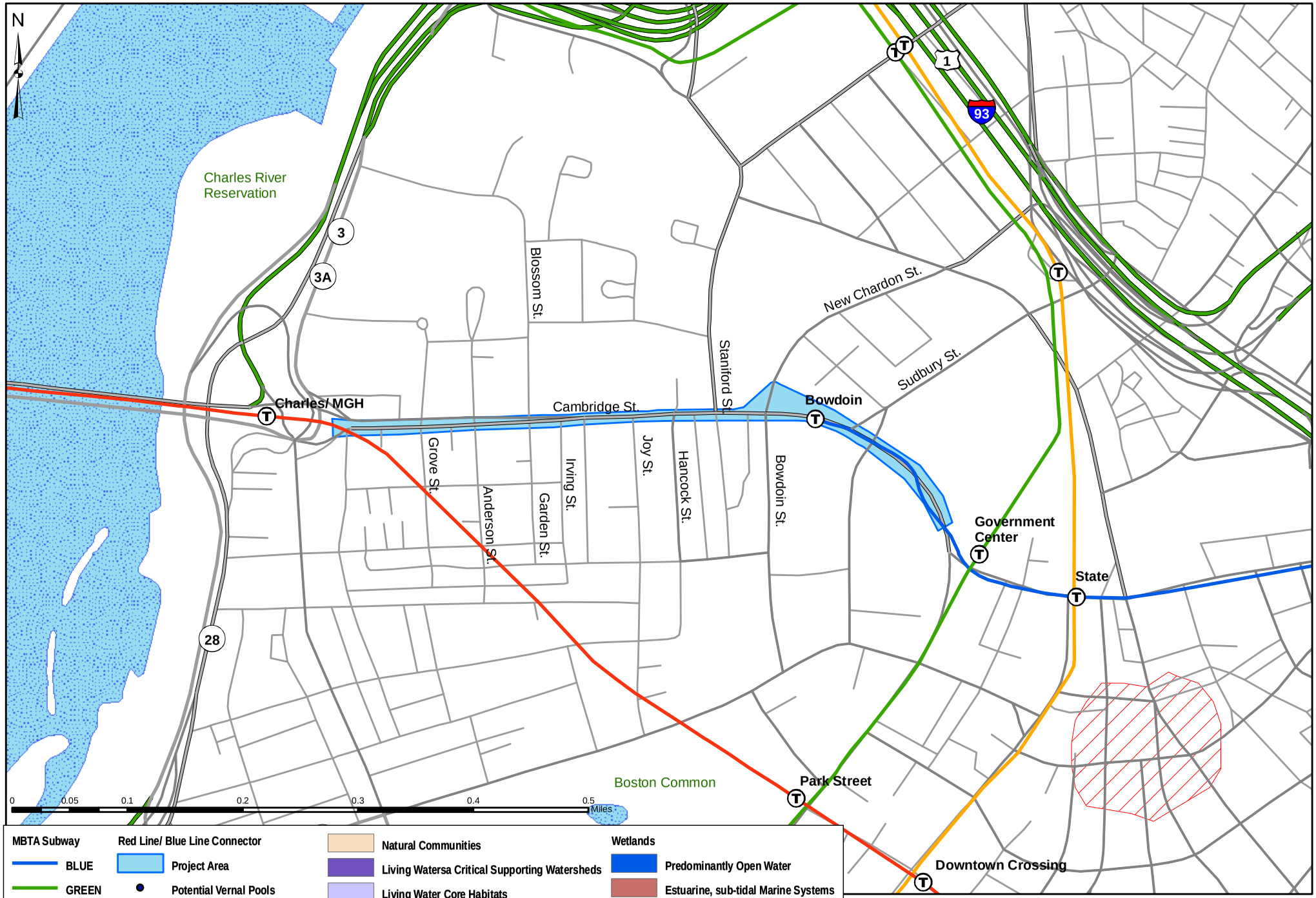
0 0.05 0.1 0.2 0.3 0.4 0.5 Miles

RED LINE/ BLUE LINE CONNECTOR RECREATION AND OPEN SPACE

PREPARED FOR EOT

PREPARED BY TranSystems

Data Source: MassGIS

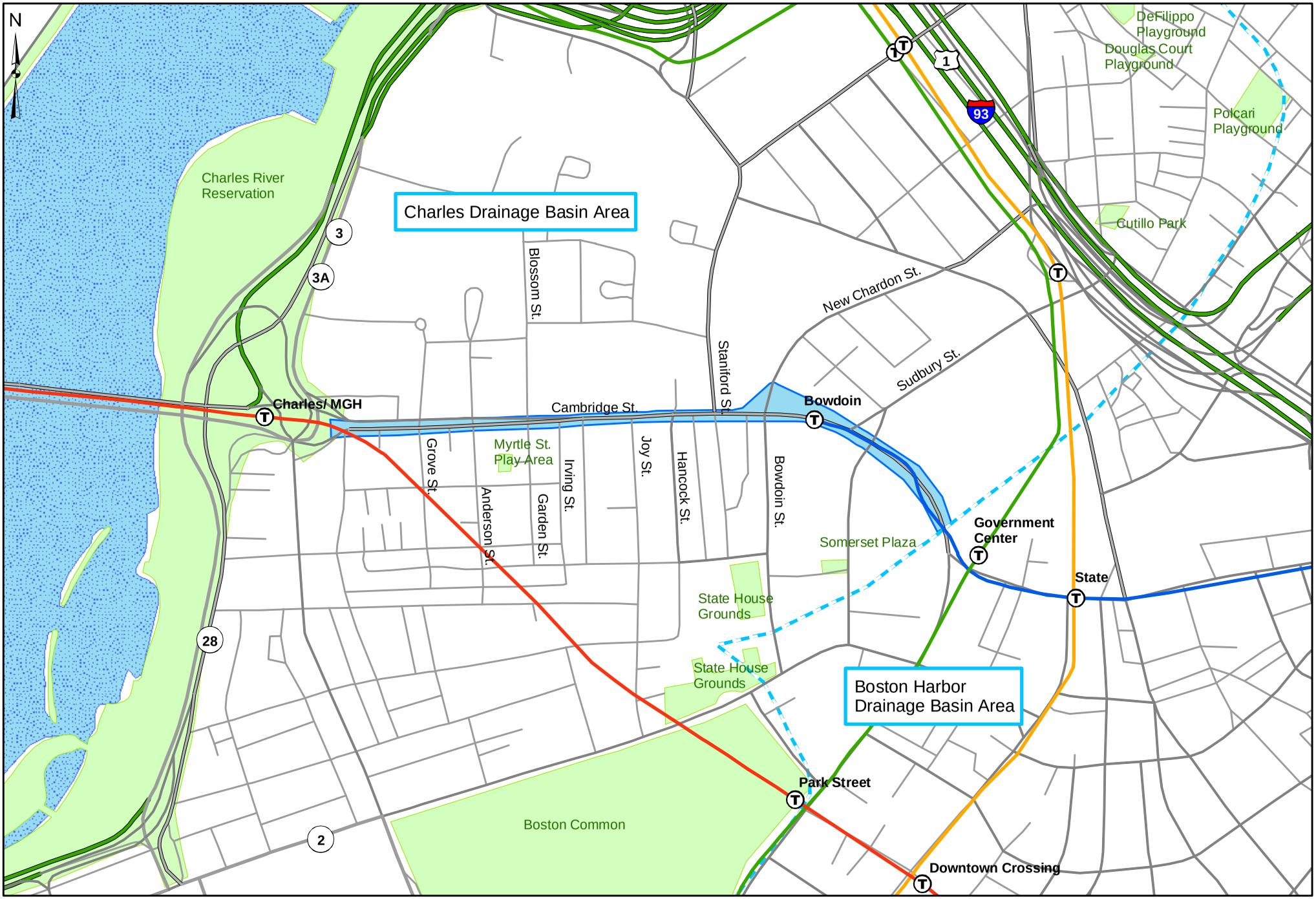


RED LINE/ BLUE LINE CONNECTOR
ENVIRONMENTAL CONCERNS

PREPARED FOR EOT

PREPARED BY TranSystems

Data Source: MassGIS



MBTA Subway
BLUE
GREEN
ORANGE
RED
Stations
Red Line/ Blue Line Connector
Project Area
Major Drainage Basin Boundary
Sole Source Aquifers
Major Stream
Aqueducts
Groundwater Discharge Permitted Site

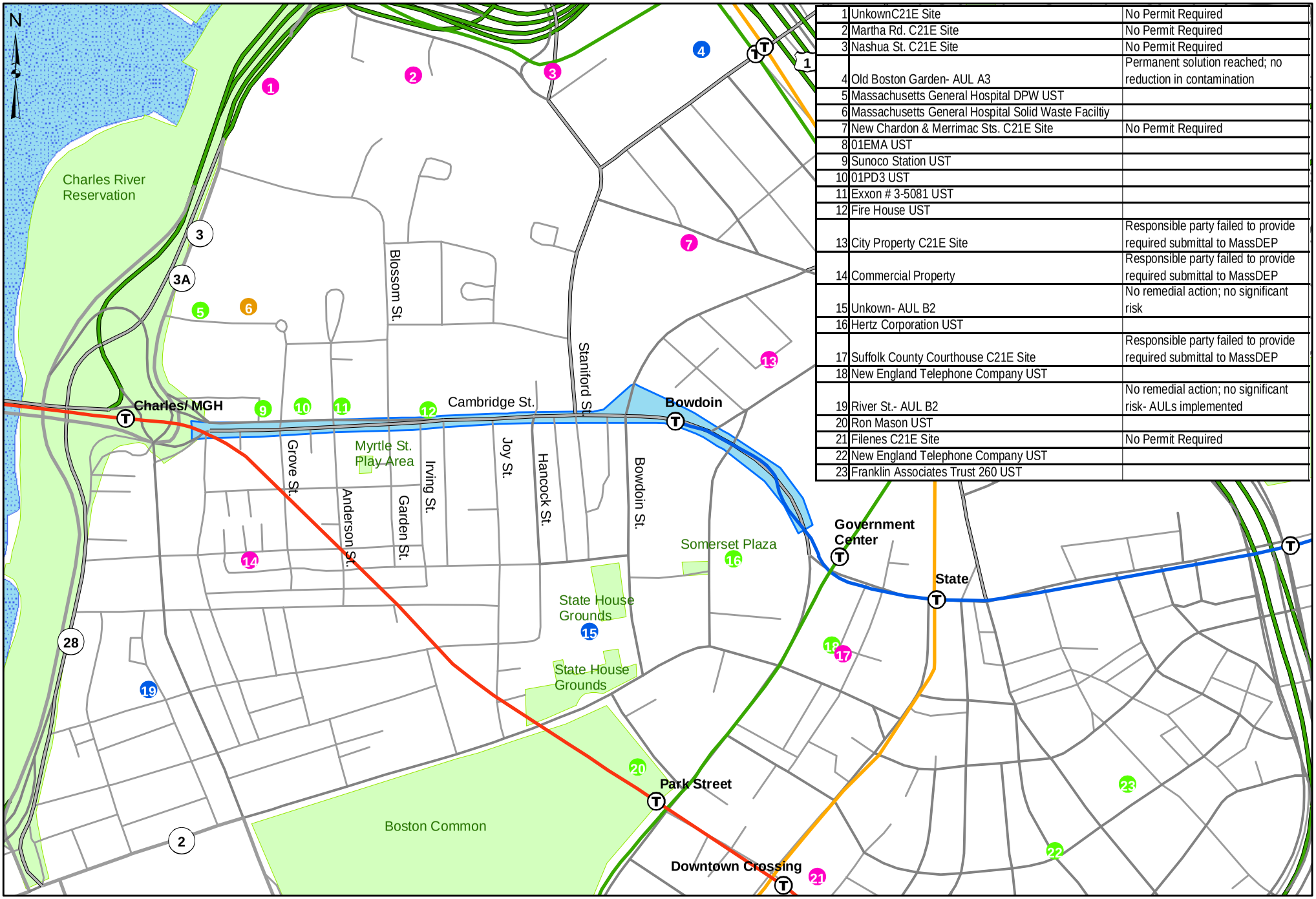
0 0.05 0.1 0.2 0.3 0.4 0.5 Miles

RED LINE/ BLUE LINE CONNECTOR
WATER- RELATED SITES

PREPARED FOR EOT

PREPARED BY TranSystems

Data Source: MassGIS



1	UnkownC21E Site	No Permit Required
2	Martha Rd. C21E Site	No Permit Required
3	Nashua St. C21E Site	No Permit Required
4	Old Boston Garden- AUL A3	Permanent solution reached; no reduction in contamination
5	Massachusetts General Hospital DPW UST	
6	Massachusetts General Hospital Solid Waste Faciltiy	
7	New Chardon & Merrimac Sts. C21E Site	No Permit Required
8	01EMA UST	
9	Sunoco Station UST	
10	01PD3 UST	
11	Exxon # 3-5081 UST	
12	Fire House UST	
13	City Property C21E Site	Responsible party failed to provide required submittal to MassDEP
14	Commercial Property	Responsible party failed to provide required submittal to MassDEP
15	Unkown- AUL B2	No remedial action; no significant risk
16	Hertz Corporation UST	
17	Suffolk County Courthouse C21E Site	Responsible party failed to provide required submittal to MassDEP
18	New England Telephone Company UST	
19	River St.- AUL B2	No remedial action; no significant risk- AULs implemented
20	Ron Mason UST	
21	Filenes C21E Site	No Permit Required
22	New England Telephone Company UST	
23	Franklin Associates Trust 260 UST	

MBTA Subway
ORANGE
BLUE
RED
GREEN
Stations

Red Line/ Blue Line Connector
Project Area

Potentially Hazardous Sites
Major Solid Waste Facilities
Underground Storage Tank
C21E Sites
Activity and Use Limitation Sites

0 0.05 0.1 0.2 0.3 0.4 0.5 Miles

RED LINE/ BLUE LINE CONNECTOR HAZARDOUS SITES

PREPARED FOR EOT

PREPARED BY TranSystems

Data Source: MassGIS